Changing Leadership Dynamics at Agility-Critical Interfaces. Action Research as a 25-years Longitudinal Study

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CHANGING LEADERSHIP DYNAMICS AT AGILITY-CRITICAL INTERFACES: ACTION RESEARCH AS A 25-YEAR LONGITUDINAL STUDY

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ABSTRACT

This chapter describes the change efforts and action research projects at a Dutch multinational which, over a period of 25 years, produced in one of its businesses a zigzag path toward collaborative leadership dynamics at the horizontal and vertical interfaces. The chapter also identifies the learning mechanisms that helped achieve this transformation. Changing the patterns at the vertical interfaces proved to be a most tricky, complex, and confusing operation. The data show that organizations need hierarchical interfaces between levels, but are hindered by the hierarchical leadership dynamics at these interfaces. The data furthermore show that competitive performance requires more than redesigning horizontal interfaces. A business can only respond with speed and flexibility to threats and opportunities in the external environment when the leadership dynamics at agility-critical vertical interfaces are also changed.

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INTRODUCTION

Many projects, be they inspired by socio-technical theory, by business process reengineering or by lean, have proved that redesigning horizontal interfaces helps to achieve dramatic improvements in business performance. However, upward information flows in hierarchies and downward change implementation are ongoing difficulties that indicate a fundamental organizational pathology for which the field of organization development (OD) has not yet found a cure (Schein, 2006). Argyris (1957, 2010) devoted a lifetime of work to the analysis of the subtleties of this pathology and produced a clear distinction between the behavioral world of unilateral control and protection (which he called Model I) and the behavioral world of free choice based on valid information ("Model II"). However, he did this by focusing on the content dimension of learning, while neglecting the incentive and interaction dimensions of learning (Illeris, 2007, p. 257). So the challenge of this study is to figure out the rules of interaction that incite people to transform an interaction pattern based on unilateral control into an interaction pattern based on informed choice for everyone involved.

In the last three decades, firms, driven by the need to improve agility, have been struggling to develop a remedy for these difficulties. This chapter analyzes the behavioral progress in the business of one such firm, based on four action research projects of the (first, internal and, then, external) OD practitioner (IODP and EODP). The thesis of this chapter is that collaborative leadership dynamics between people at different levels of the hierarchy improve the agility of the business, an ability that in sports sciences is defined as "a rapid whole body movement with a change of velocity or direction in response to an external stimulus" (Sheppard & Young, 2006). Acknowledging the potential value of the contribution of "lower-level" employees to "higher-level decision-making" by entering into a dialogue leads to more inspired and better informed action-decisions, and thus to greater shared confidence that these actions will help achieve the intended goals. Acknowledging the interdependence on lower-level contributions is, however, at odds with the old unilateral rule of hierarchical interaction that both managers and employees are accustomed to.

The purpose of this study is twofold: (a) to provide empirical data that demonstrate the possibility of a transformation from hierarchical leadership dynamics toward collaborative leadership dynamics at hierarchical interfaces and (b) to define the interaction rules that help the local action research project to produce this transformation.

This study provides four new contributions. First, a longitudinal description of changing interaction patterns at critical interfaces through a series of action research projects the objective of which is to help transform the hierarchical culture in the interest of agility. Second, this study provides an extension of the theoretical framework of humble inquiry (Schein, 2013a) by proposing the concept of extraordinary conversation. Third, this study contributes to the theoretical framework of action research as a tapestry of learning mechanisms (Fredberg, Norrgren, & Shani, 2011) by proposing the concept of interaction rules as a relational learning mechanism. And fourth, this study results in a new definition of hierarchical and collegial accountability relations.

The case study results in three conclusions:

1. Over the 25-year timespan, hierarchical interactions can be observed to progress to collaborative interactions between leadership roles at vertical interfaces, with managers involving knowledge workers[1] in strategy development and knowledge workers showing adaptive leadership in their own productive process;
2. A collaborative community can emerge out of an organization with traditional leadership of command, control, and intimidation;
3. The main learning mechanism that helps managers and knowledge workers change their interaction pattern are interaction rules that allow them to negotiate the felt difficulty and identify their own roles in working on it in a creative, responsive way.

In this study, the concept of agility indicates a quality of the organization–environment interface while the concept of responsiveness is used to indicate the quality of the interactions between human beings working in different layers and functions. We shall see that we need to distinguish between suppressive and creative types of responsiveness. While both types of responsiveness produce learning, suppressive responsiveness produces defensive learning and creative responsiveness enables the deep learning across domains and hierarchical levels that is required to develop *and* maintain an agile organization.

The research question we will try to answer is, what tapestry of learning mechanisms will enable organizational members to transform their leadership dynamics at agility-critical interfaces (see Fig. 1)? The research method is a multiple case study of four action research projects and two interview projects with the aim of developing theory from practice.

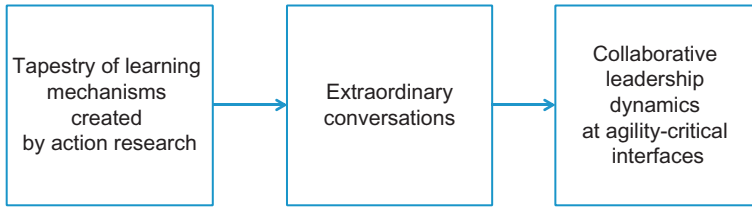

Fig. 1. Conceptual Framework of This Study.

THE RESEARCH SETTING

The case organization is the Dutch multinational Gist-brocades (Gb). This firm existed from 1869 until its integration into DSM in 1998. In 1869, it was the first company to produce yeast in an industrial process, and in the 1940s, it was the first company to produce penicillin on an industrial scale. In the 1980s, the production of enzymes was added, creating a company with three product groups operating in the pharmaceutical, food, and industrial enzymes markets. Socially, Gb was also an advanced company as it was the first in the world to introduce a workers council, a company journal, and social services such as good housing for its employees. Van Marken, the founder of the company, was a member of the group of social entrepreneurs in the Netherlands, a group that produced the ideas for the social state that was created in the Netherlands in the period 1870–1960. He combined his technological and social innovations with micro innovations such as having weekly conversations with his employees. Though these conversations were probably embedded in paternalistic relationships, they may have produced the roots for extraordinary conversations later on that mark the emergence of the collaborative relationships that we highlight in this study.

In the 1980s, however, a twofold desire for transformation emerged. Managers, not the owners, had become responsible for strategy, and employees had grown dissatisfied with the paternalistic culture.

In 1989, a new CEO openly recognized that the old hierarchical model no longer worked. He invited everyone to develop new behavior based on six new company values: market orientation, result orientation, cross-functional teamwork, open and honest communication, a learning, inquiring attitude, and independent, nonhierarchical behavior. But he was the boss of course. And the concept of the managerial accountability hierarchy (Jaques, 1996) was undisputed. Everyone, including the CEO, needed to

develop new concepts, attitudes, and ways of acting to cope with this contradiction of being required to produce nonhierarchical behavior in a hierarchical structure. OD projects were executed to help people cope with this contradiction and the tensions it produced (see the Appendix for an overview of the OD projects during the 25 years).

The author became intrigued in Gb in 1990 when he trained the lead engineers of Gb's engineering department in taking result responsibility for their part of an innovation project. In 1992, he applied for the new position of internal organization development practitioner (IODP). His task was to design and install the learning mechanisms that would help people develop the new behavior that fitted with the new values.

Three learning mechanisms already were in place. There was a strategy ("back to the core"; "growth through innovation") that was discussed intensely with all layers of management. There was an experiment to get people out of their silos by creating cross-functional result teams supported by two consultants, one specialized in marketing and one in behavioral change. And there was direct communication between the result teams and top management by holding large group meetings in the main building and by authorizing the leaders of the teams to call the CEO directly when middle managers were blocking their progress. Building on this, the task of the IODP was to transfer the learning of the result teams to the whole organization.

In the autumn of 1992, a power struggle developed that led to the termination of the contract with the consultancy firm. The members of the result teams feared that traditional leaders had won the fight and that the change would be undone. The IODP informed the CEO of these fears, and they decided to have a meeting with the result team members. The conversation held during this meeting, a short extract of which is given below, took place from 6:00 to 7:30 p.m.

CEO:	*"I have tossed my towel in the corner as the champion of the change. The managing directors of the divisions will take the lead from now."*
Result team members:	*"The divisional directors weren't exactly our allies in working cross functions. They were very receptive to the complaints of the line managers who felt they were losing power."*
CEO:	*"Divisional directors want to embed the cultural change structurally in the whole organization in order to end the present anarchy."*

Result team members:	*"We would like to maintain direct contact with you."*
CEO:	*"I don't want that anymore. I feel drained as the cultural change program has demanded a lot of my energy, especially the large group meetings and the hotline."*

The conversation gave the result team members some understanding of what was going on and also some confidence about the future. So conversations do matter. And structure matters too, as it was the perspective of restructuring the divisions that gave new hope. To understand interactions at agility-critical interfaces, we need to build conceptual bridges between conversations and structure. In the conversation presented above, we can see such a bridge: the conversation embodies a structure in which a CEO renders an account of his actions to people three layers below him. In a hierarchy, accountability usually goes bottom-up, but here we see it go top-down. Reciprocity of accountability is at work here, which could be seen as a collaborative principle; it is certainly not a unilateral principle.

One month later, Harald Vorstman is hired for one day a week to help senior management restructure the divisions around cross-functional teams. Vorstman had had a long career at Philips and conceptualized his managerial experiences in an "intrapreneurship" model (Vorstman, 1993). This model provided Gb with two cognitive learning mechanisms. First of all, there was the concept of Mr. X, which is the function that guides the product or service through the various processes of the firm. This Mr. X is missing in most companies, but very much needed. As Mr. X's guidance is based on a business plan, Mr. X can be called the entrepreneur or business manager. Vorstman's model defines the tasks of the entrepreneur as making a business plan and managing the interfaces between primary process functions by specifying the output to be submitted at the interface by one primary process function and to be received by the next primary process function. Gb's management recognizes the leader of the result teams as this Mr. X.

The second cognitive learning mechanism was Vorstman's concept of two relations: the hierarchical accountability relation and the lateral accountability relation.[2] In the hierarchical relation, accountability flows unilaterally toward the boss, while in the lateral relation, accountability is a two-way affair (Fig. 2). Mr. X, who is the entrepreneur and interface decision-maker, has a lateral rather than a hierarchical accountability relation with the primary process functions, so he is not authorized to intervene

Fig. 2. Vorstman's (1993, pp. 32–33) Visualization of the Two Relations: To Left: the Hierarchical Accountability Relation, in Which Task and Authority Flow Downward and Accountability Flows Upward, and to the Right: the Lateral Accountability Relation, in Which Accountability Flows Both Ways.

in the primary process itself. This helps Gb's management to align the result teams with the line organization and thus bring order to the chaos.

These concepts were well received, both by the result teams and by the line organization. Vorstman and the IODP helped the divisions to redesign their management structure. The new positions of business manager (Mr. X) and business teams are defined, thus creating structural learning mechanisms as well. Business managers have profit and loss responsibility and work with a business team consisting of people of all relevant primary and supporting functions. It was agreed that everyone in these teams would share lateral accountability relations. However, neither Vorstman nor the IODP were satisfied with how things developed. Vorstman helped the anti-infectiva division but ended his assignment at the end of 1993, stating that the managing director of the division (supported by the CFO) did not provide the business managers with enough authorities, information, and budget systems to do a proper job. The IODP helped the managing director and human resource manager of the bakery division to redesign the management structure, but the divisional director terminated the relationship when the IODP dialoged with the country managers about the implementation of the new structure. The director simply presented the new design to the country organizations and instructed them to implement it in their organizations. The CEO stayed out of these discussions, declaring the organizational design of the divisions to be a matter of the divisions themselves.

Against this background, the action research question evolved that turned out to be a 25-year project.

EVOLUTION OF THE PRACTITIONER'S RESEARCH QUESTION

First of all, the IODP faced the question of the change approach. When he practiced a participative approach, he was excluded from the change implementation although he knew the change would not be effective without a participative approach. The first action research project (AR1) in Belgium confirmed the effectiveness of the participative approach and even showed a higher level of participation in a time of crisis than the IODP had ever witnessed before. The second and third action research projects (AR2 and AR3) are successful attempts to introduce this high level of participation in Delft, the main site of the company. Encouraged by these results, the IODP wrote a dissertation, building on a conceptual model that links levels of participative acts with levels of organizational receptivity, knowledge and ego development (Pasmore & Fagans, 1992). The dissertation provided survey data and clinical observations that supported this model (Schuiling, 2001).

In March 2002, the IODP heard a story in the canteen that made him want to investigate the interaction rules that were really being practiced at the vertical interface while busy with his action research projects helping people to work with the espoused interaction rules, that is, the values of the company (see box: In between, unseen).

In between, unseen

In 1992 two members of the penicillin result team visited China and observed that Chinese competitors then had two plants for producing the same penicillin they did. They started to collect intelligence systematically. In 1995 two members – of what was now called the business team – visited China again and reported that China then had ten penicillin plants. The business team analyzed the data carefully and concluded the Chinese were able to reduce their sales price to 50% of the market price at the time. The team developed the strategic plan of using Gb's position as world market leader to take

the initiative in lowering the price, thus forcing competitors to do the same and buying up the companies that went to the wall and removing them from the market. The business manager – the entrepreneur, according to the formally applied Vorstman model – proposed this new strategy to the managing director of his division who, however, forbade him to speak with anyone about it, threatening to otherwise "take my machinegun and shoot you." Intimidated, the business manager checked with two members of the divisional management team about what to do. They advised him to follow the director's order. The business manager said the following to the OD researcher in 2002:

> *"A double reality emerged. Formally, in the budget, we had a high price for our product; informally, we knew this is not real. At first I found it hypocritical that I couldn't communicate about this honestly. Slowly, however, I began to understand that a game of a higher order was being played. The penicillin products generated 'only' about half of Gb's turnover, but made a disproportionately larger contribution to Gb's profit. In the next year I was invited to participate in the budget meetings with top management and I used this opportunity to inform them 'between the lines' of my scenario. However, an excessively high price again entered the budget, making me accountable for a turnover and a profit that I knew to be impossible to achieve." (Schuiling, 2002)*

Sales prices kept going down, more than ever before in this cyclical market. In the summer of 1997, the CEO invited the business manager for a meeting together with the CFO and the managing director of the division. His analysis that the world market would have structurally lower prices was formally accepted and submitted for discussion by the divisional management team. The CEO and CFO communicate an official profit warning to the stock market on August 5, 1997. In an interview with the IODP in 2002 the CEO says the following:

> *"We were focusing on growth by acquisition in the food market and were developing a radical new technology for the production of penicillin that would allow for a cost price even below that of the Chinese. We needed the cash flow generated by the penicillin to fund both objectives. We lost the race against the clock. That's why we decided to merge with another company."* (Schuiling, 2002)

Agility was demonstrated in the end game after two long years during which any internal discussion about the evolving new reality had been suppressed.

The IODP was shocked morally by the discrepancy between espoused and applied values, even though he had felt this discrepancy all the time. On an intellectual level, however, the episode made him rethink the issue of organizational design. He concluded that Vorstman's model did not provide the tools to question what happens in strategic processes. He approached Vorstman who reflected on this case as follows:

> "The rule my model presents to the business manager is this: When your boss overrules you in your authority to set the sales price of the product, you say to your boss: "I cannot be responsible for profit if you set a price for the product that is not real." Giving back your responsibility is perfectly legitimate within the hierarchical relationship." (Schuiling, 2008b, p. 127)

Vorstman's interaction rule leaves, however, the full burden on the shoulders of the individual lower in rank. Gb's management liked Vorstman's proposition that only individual accountability can work and that team accountability is a dangerous fiction. But here we see an individual dangling alone with the burden of a changing world market. Vorstman's rule allows an individual to step out of the hierarchical relation, but does not help improve the strategy process, or change a culture of intimidation. The courage to challenge the intimidation requires a climate in which people feel encouraged by top management to come forward, even when an intermediate boss stands in their way. And, as we have seen, the CEO resigned from that role in the fall of 1992.

So a new research question evolved. Instead of researching levels of participation, a search began for a process model of organizational design that provides an alternative for the hierarchical model of accountability (Schuiling & Van de Wiel, 2006). By chance, the now-external organization development practitioner (EODP)[3] came into contact with the self-managing teams organization in the plants of the anti-infectives business in Delft. This led to a new research question: How is it possible that a business that had an intimidating culture in the 1990s produced self-managing teams in the 2000s? This question produced an awareness of the close link between economic and psychological realities. When a changing world market threatens the market leadership and even the survival of a business, anxieties are created among both managers and employees. Intimidation is a suppressive way of coping with these anxieties. From this perspective, the action research projects of the 1990s were designed to develop alternative, more collaborative, ways of coping with anxiety-generating realities. The purpose of this study is to see the continuity amidst the discontinuities in the events of the 25-year period and to articulate this

awareness in the form of alternative rules of interaction on the vertical interface.

This longitudinal study presents six study projects to inform a debate around this question. The first case (see box: In between, unseen) illustrates the unilateral command and control approach, which has a negative impact on agility. Four action research projects are then described that show that collaboration is a feasible option for improving agility. An intermezzo describes several examples of managers who manage to work in a collaborative way without the help of action research. Of course, each study project had its own research question, which developed while going from one project to the other. Table 1 provides an overview of the four action research projects and describes the research question in the terms the local change agents used to define their felt difficulty. The thread that connected them all for the action researcher is the tapestry of learning mechanisms that enables organizational members to transform their leadership dynamics at agility-critical interfaces. The next section provides the conceptual framework that will be used in all the studies.

TOWARD A FULL-PROCESS APPROACH OF LEADERSHIP DYNAMICS AT INTERFACES

The topic "changing leadership dynamics at vertical interfaces" requires a multi-disciplinary approach, using concepts from such fields as organizational design, strategic management, leadership, organizational learning, sociology, psychodynamics, and action research. This section presents the selection of concepts that will help us to rethink interaction patterns at vertical interfaces: adaptive coping, agility, a business as a bundle of productive processes, horizontal and vertical interfaces, leadership dynamics, ABX dynamics, felt difficulty, design of learning mechanisms, extraordinary conversation, and interaction rules. This string of concepts will be used as a conceptual handrail in the description of the four action research projects. This section starts with agility as this serves as the indicator of the impact of change. Five criteria of business agility will be presented and will be related to the four productive processes that together make up a business. Leadership dynamics are introduced to understand the adaptive coping of a business. Action research is then defined as enabling leadership dynamics with a triadic relationship between actors and a felt difficulty. This will allow for a definition of organizational learning as a triadic

Table 1. Comparative Summary of the Four Action Research Projects.

	AR1: The Redesign Project	AR2: The Building on Strength Project	AR3: The Work Stress Project	AR4: The Star-Role Project
Action objective in local situation	Cost reduction and empowerment	Develop competences to interact across hierarchical levels	Find causes and solutions to reduce stress of all involved in R&D unit	Better communication and decision-making at interface between self-managing teams and manager
Felt difficulty by local change agents	How can we reduce operating costs in such a way that we build the confidence that the new system will work and empower the operators and ourselves at the same time?	To design and apply an approach that enables high potentials to do a confrontational inquiry with top managers	To enable a confrontational inquiry with all members of the system under very high pressure to learn to cope with organizational stress	How can we improve decision-making between star-point roles and production manager?
Total inquiry process	Diagnostic inquiry + Collaborative redesign + Survey feedback	Diagnostic inquiry + Training + Survey feedback + 360°	Diagnostic inquiry + Survey feedback + Large group conference + Confrontational inquiry in MT	Humble inquiry + Collaborative redesign
Time frame	1994–1996	1998–1999	1998–1999	2012–2013
Employees involved	40	60	110	17
Inquiry team	The change team + IODP + external consultant + study groups	The four trainers of the program	The management team + IODP	Four operators as quartermasters of the redesign + 2 EODPs

Cognitive learning mechanisms	Production as a flow Collaboration: invite people with different interests and objectives to participate in study groups	Method of core quadrants of Daniel Ofman A diagram of the organization as a set of horizontal and vertical interfaces Motto: stand for your ideas. Don't take no for an answer	Organizational stress model, constructed with the data of this department	Boundary role person Portfolio of roles
Structural learning mechanisms	The process of collaborative redesign led by the change team: inviting people of all functions and all layers in identifying problems, generating alternative solutions, selecting specific solutions, planning their implementation and evaluating the outcomes, in three rounds going from the abstract level to concrete operational details	Training as a place and time for inquiry	The process of collaborative redesign applied in a sequence of small group meetings, large group meetings and study groups	Training as a place and time for inquiry The process of collaborative redesign led by four operators in three rounds: HR star roles, other star roles, testing role descriptions and large group meeting
Outcomes	Organization based on self-managing teams; with 47% lower fixed costs; significant increase of self-efficacy and satisfaction with own	Participants report: Examples of increased competence of self-regulation The training is a moral energizer: other people	Significant decrease of level of stress and increase on indicators for satisfaction and indicators for personal growth	

Table 1. (*Continued*)

	AR1: The Redesign Project	AR2: The Building on Strength Project	AR3: The Work Stress Project	AR4: The Star-Role Project
	influence, leadership style, cross-functional collaboration and open communication.	encounter the same problems as I do! Managers' report: Participants do now seek the conversation with me and isolate themselves less with a negative attitude It offers us the chance to pause and reflect on the needs of the angry young men The comments of the professionals freshen my perspective on the issues of my daily work	All projects within budget in 1999	
Research team	IODP + 2 professors coaching the dissertation project (one of them being Vansina) + 2 Master's students during survey feedback	IODP + 2 professors + 1 Master's student for survey feedback and 360	IODP + 2 professors + 1 Master's student for survey feedback	The 2 EODPs

Tensions between roles of action researcher	To act as internal consultant in the plant and at the same time become accepted in the academic setting	To act as internal program leader of the training and apply rigorous research methods at the same time	In this R&D environment the combination of the consultant role and the research role is no problem; the duality of action researcher and member of corporate staff however mangles the depth of analysis	To develop in hindsight a conceptual interpretation operators can use as well
	How: presenting survey feedback as a way to measure progress on social indicators as empowerment, open conversation, etc.	How: be satisfied with a pre-measurement, do not force the group in a quantitative follow-up measurement when they feel this does not help their learning, negotiate a qualitative follow-up measurement	How: try to involve HR, but HR backs off	

relationship between leadership dynamics, felt difficulty and action theories. The concept of extraordinary conversations is then introduced and the section closes with a discussion of interaction rules.

Agility of a Business as a Bundle of Productive Processes

Interfaces are agility-critical when they are part of the adaptive coping cycle of the business, which Schein (2013b) describes as consisting of the following stages:

- Sensing a change in some part of the internal or external environment;
- Getting the relevant information to those parts of the system that can interpret it, digest it, and act on it;
- Modifying internal processes as needed without creating undesirable side effects;
- Exporting new "products" as needed for survival and growth of the system;
- Obtaining feedback on whether or not the new products achieve the goals intended, which starts a new sensing cycle.

Building on the work of Ansoff (1984), we will use the following set of criteria to assess the quality of adaptive coping: operating agility, competitive agility, innovation agility, entrepreneurial agility, and administrative agility.[4] Within a full-process approach, these types of agility can be linked to four productive processes (see Fig. 3).

Competitive agility – that is, optimizing the firm's profits by responding fast to variations in demand and in competitive conditions (Ansoff, 1984) – is positioned in the "space between" the four processes. It is the result of the interaction between all those responsible for the four productive processes. In other words, competitive agility is, even more than the other types of agility, the result of sharing leadership.

The intention of the full-process model is twofold: to see a business as a bundle of productive processes and to recognize that a productive process is both a work process and a relational process. A work process can be analyzed in terms of input, operation, and output. A relational process is constitutive for the interactions between human beings and the identities they develop in these interactions.

The concept of productive processes builds first of all on the work of Hoebeke (1994) who integrated the work of Stafford Beer, Elliott Jaques, and Peter Checkland into a concept that defines a business by a hierarchy

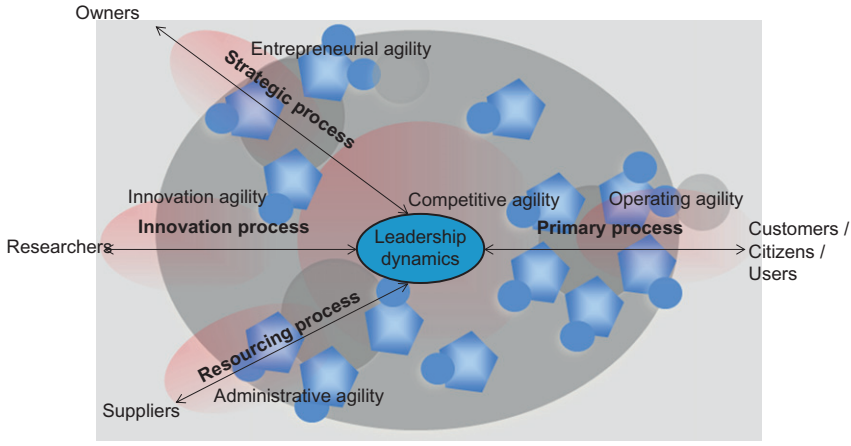

Fig. 3. Full-Process Model of a Business.

of processes, not by a hierarchy of persons in positions.[5] A productive process transforms a specified input into a specified output. Management can be conceived as a productive process or, more precisely, management can be defined as the execution of the strategic process of developing, deciding, auditing, and revising the strategy of the business. The input of the strategy process can be a doubt, an idea, or a question; the output is a shared strategic direction that helps all involved to make sense of the situation in which the business finds itself and to determine where they want to be and how to get there. The primary process creates today's added value by producing an output that fulfills the customer's needs in society. The innovation process creates tomorrow's added value, anticipating the emerging needs of customers and society. And the resourcing process transforms the needs for resources such as equipment, competent people, ICT systems, housing facilities, and financial systems into a fulfillment of these needs.

Productive processes can be ranked hierarchically: "A process of a higher order is one whose output creates conditions for one of a lower order" (Hoebeke, 1994, p. 11). For instance, the output of the strategic process creates conditions for the primary process and is thus of a higher order.

Hoebeke (1994, p. 15) describes the technique of interface negotiations only with respect to agreeing to contributions, responsibilities, and accountabilities within a process, not between processes. We therefore propose distinguishing between horizontal and vertical interfaces. Horizontal

interfaces are interfaces between operations in a productive process, while vertical interfaces are interfaces between the productive processes. An interface is agility-critical when the meeting between the interaction partners can impact the "rapid whole body movement" of the business. Vertical interfaces can be just as agility-critical as horizontal interfaces.

De Sitter (1994, p. 375) related interfaces to interactions when he defined interfaces as "meeting chances" for "interaction partners" between "operations within one product flow." Whereas the term "product flow" in this definition still reflects a socio-technical focus on the production process, the full-process approach attempts to redefine the structure of all productive processes of a business. Building on De Sitter's definition, the full-process approach defines an interface as a meeting chance for interaction partners in and between the productive processes that make up a business.

The "space between" between the four processes needs to be construed rationally and relationally. The interactions in this space express the ability of a business to learn to combine the rationality of a work process with the relationality of the interaction partners, in normal times as well as in times of crisis. The space between is the space where leadership dynamics unfold. "Bringing relationality to the leadership field means viewing the invisible threads that connect actors engaged in leadership processes and relationships as part of the reality to be studied" (Ospina & Uhl-Bien, 2012, p. XX).

Defining a business as four loosely coupled productive processes allows for adaptive coping to start in any productive process. However, wherever it starts, it must cross the space between, to enable agility as a "whole body movement." In adaptive coping an organization shows its "ability to rise to the occasion" (Schein, 2013b, p. 94). This ability can best be seen as a combination of stumbling and excelling, of knowing how to take success and set-backs with dignity.

Leadership Dynamics

When adaptive coping processes fail, the result is organizational stress. Organizational change is then needed to restore the adaptive coping cycle. This requires leadership as "the ability to step outside the culture (…) to start evolutionary change processes that are more adaptive" (Schein, 1992, p. 2). This leadership is not a heroic act of an individual manager, but a complex relational process between three leadership roles: administrative, adaptive, and enabling leadership (Uhl-Bien, Marion, & McKelvey, 2007,

p. 306). Administrative leadership "refers to the actions of individuals in formal managerial roles who plan and coordinate organizational activities." Adaptive leadership "is an emergent, interactive dynamic that produces adaptive outcomes in a social system. It is a collaborative change movement that emerges non-linearly from interactive exchanges (…)." Enabling leadership "fosters enabling conditions that catalyze adaptive leadership (… and helps) disseminate innovative products of adaptive leadership upward and through the formal managerial system."

The premise of this "three-role" leadership theory is that under conditions of knowledge production managers should enable, rather than suppress, informal network dynamics (Uhl-Bien et al., 2007, p. 302). Empirical research (Uhl-Bien & Arena, 2011) shows, however, that when faced with complexity, many organizations turn to increased administrative leadership, while the recommendations of the administrative models can in fact be counterproductive in such a situation, causing the organization to tighten to such an extent that it inhibits or stifles the requisite adaptive dynamics. Here the administrative leadership reacts by suppressing the initiatives of adaptive leadership in response to a changing environment. Enabling leadership is to encourage bottom-up initiatives and to seek ways of integrating them into the strategy, structure, and systems of the organization. When the interplay between the three leadership roles is insufficiently effective, action research can be of help.

ABX Dynamics in Action Research

In the context of leadership dynamics, action research can be seen as temporarily fulfilling the enabling leadership role. When the administrative leaders become aware that their approach will not solve the problem faced by their business and adaptive leadership is struggling to emerge, action research can help foster enabling conditions for a collaborative change movement that will solve the business problem by restoring or improving agility at critical interfaces.

The modality of action research that can fulfill this function is a dialogical one. The dialogical modality of action research is based on the assumption that the relationship between researcher and "researched" is an intersubjective, interactive relationship that always involves a third element: it is about something that bothers the other. For this triadic relationship, Van Beinum (1998, p. 6) provides the technical term "ABX system": the researcher (A) and the other (B) are jointly involved in addressing an issue

(X). The three elements are interdependent, as each element can only be defined by its relationship with the other two. When the dialog between action researcher and client (an individual or a group) generates a new definition of X, this can be a reason to include more stakeholders in the inquiry process. As these other stakeholders have different interests, perceptions, and objectives, they will add other "felt difficulties" to the conversation, which can lead to a redefinition of X. In multiple sequences of acting and reflecting, A and B will develop a practical knowledge of how to cope both with the complexity of X and with the complexity of the leadership dynamics between the Bs (Fig. 4).

X is the "felt difficulty," that is, the difficulty the local actors experience in not knowing how to proceed with their actions and for which they seek the help of the action researcher. Without a felt difficulty, there will be no inquiry process (Dewey, 1938/1991, p. 109). The action researcher may

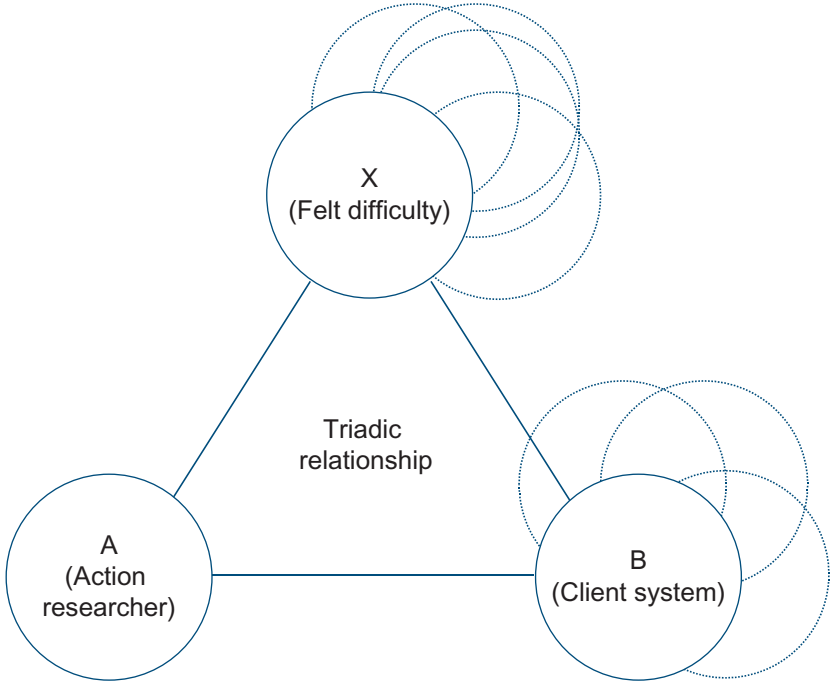

Fig. 4. Action Research as a Local Inquiry Process With Multiple Clients and Multiple Felt Difficulties.

introduce his content-expertise immediately (see AR1) or later on (see AR4), but he will always use his process expertise to observe the process of inquiry that will help the client in acquiring the competence to move forward in addressing the felt difficulty.

The term "ABX dynamics" is used to describe the dynamics between the A, B, and X: (1) the ongoing construction of X; (2) the ongoing involvement of stakeholders in the inquiry process; and (3) the ongoing efforts of the action researcher to work with the tensions that will inevitably evolve between the routines of the client system and the process of inquiry the action researcher brings to the situation. In this dynamic, the action researcher is also faced with vertical and horizontal interfaces, as the primary client is the one who ultimately owns the issue being worked on (X), engages the action researcher, and provides the budget for the action research project. The vertical interface between primary client and action researcher is that the primary client has the authority to include or exclude the action researcher.

Other changes relevant for B and X may develop in other parts of the system "in the meantime" and can impact ABX dynamics deeply. Van Oss and Van 't Hek (2012) explain complexity with help of John Lennon's dictum "Life is what happens to you while you're busy making other plans." Consequently, the action research project should be just as adaptive and agile as the business it is trying to help.

The task of the action researcher is to organize a series of dialogs between the people involved so that everyone feels free to speak and knows that his or her contribution to a joint change effort is taken seriously. There is no one best way to organize these dialogs: "The nature of the organization of the dialogs, and of the actual jointness of the overall process, has to emerge locally – from within the dialog, so to speak – and has to be decided on in the context of the particular circumstances of each research" (Van Beinum, 1998, p. 7).

Design of Learning Mechanisms

Action research enables organizational learning between interaction partners within a business. This study assumes that organizational learning has three dimensions: a felt difficulty, action theories, and leadership dynamics (see Fig. 5). This builds on Illeris' (2007) general theory of learning as having three dimensions: incentive, content, and interaction.

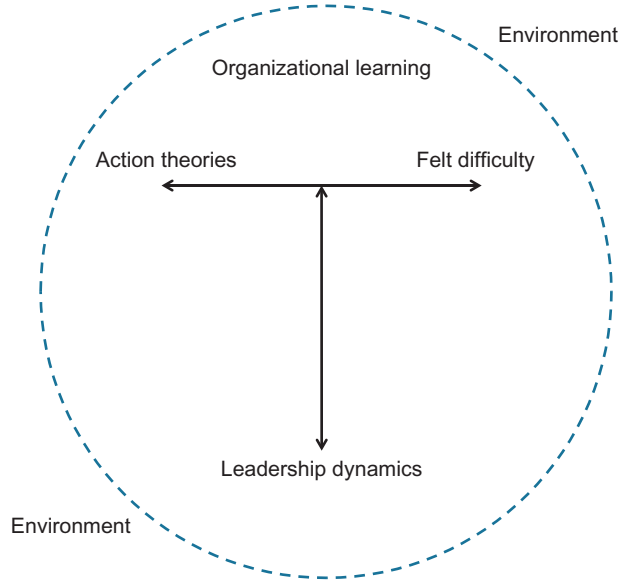

Fig. 5. Three Dimensions of Organizational Learning.

We assume the incentive of organizational learning to be a felt difficulty that the members of an organization experience and which gives them the energy to learn. The content dimension of organizational learning is the action theories that members use in their own actions and/or espouse about their own actions. The interaction dimension of organizational learning is the leadership dynamics that takes place at agility-critical interfaces.

Organizational learning is enabled and encouraged by learning mechanisms, which are organizational features (Shani & Docherty, 2003). We follow Shani and Docherty in their distinction of cognitive and structural learning mechanisms and add the concept of a relational learning mechanism to grasp what happens in leadership dynamics. The relational learning mechanism is a way of relating that enables learning in interaction. While the cognitive and structural learning mechanisms can be designed, the relational learning mechanism emerges in interaction. This relates to the distinction between the learning situation and the learning process. While the learning situation can (and should) be professionally designed, the learning process is self-regulating (Negt, quoted by Berkers, De Rooij, & Schuiling, 1981). Learning is a concept for a process within the learner, while concepts such as the learning situation and the learning mechanism refer to the

perspective of the facilitator who creates learning situations. In a real learning situation, there will be two learning processes as there is also a learning process within the facilitator; real learning situations contain surprises for both participants and facilitator (Vermaak & Schuiling, 2010, p. 21).

The relational learning mechanism works mainly through conversations.

Extraordinary Conversations

An extraordinary conversation can emerge in a series of conversations.[6] An extraordinary conversation is a conversation that generates creative responses to adaptive challenges. The term "extraordinary" refers to "outside the ordinary," to "optimal learning points," that is, occasions that juxtapose order and disorder as a social space where learning is possible (Weick & Westley, 1996). Learning is connected with establishing routines *and* accepting disruptive non-routine behavior in the interest of alignment (*ibid*., p. 445). This study distills interaction rules from the extraordinary conversations held during the action research projects that changed leadership dynamics at vertical interfaces.

Extraordinary conversations cannot be planned. An extraordinary conversation happens *to* us and we have the choice to either receive it or suppress it. Neither do extraordinary conversations just appear out of the blue. An extraordinary conversation is one in a series of conversations that have been carefully planned and designed. Schein (2013a) distinguishes four types of inquiry: humble inquiry, diagnostic inquiry, confrontational inquiry, and process-oriented inquiry. He differentiates them to the extent that they "actually control the flow of the conversation" (Schein, 2013a, p. 39). In a humble inquiry, one tries to minimize one's own preconceptions and maximize one's listening as the conversation proceeds. Diagnostic inquiry, confrontational inquiry, and process-oriented inquiry are forms in which the one posing the questions takes ever more charge of the conversation. We should perhaps be even subtler in our use of terms such as steering, controlling, or taking charge of the conversation. According to Schein, humble inquiry "does not influence either the content of what the other person has to say, or the form in which it is said" (2013a, p. 43) while diagnostic inquiry "influences the other's mental process" (2013a, p. 43). This "non-influence" principle does not seem to be consistent with Schein's statement that humble inquiry helps build relationships in which the one asking "temporarily empowers the other person in the conversation and temporarily makes me vulnerable" (Schein, 2013a, p. 9). How would

empowerment and vulnerability not influence the other's mental processes? The concept of the ABX system assumes that relational and cognitive processes entangle and interact.

An ABX action researcher therefore asks questions both to help the Bs to get a clearer picture of X and to develop a relationship between the Bs "that facilitates relevant, task-oriented, open communication across status boundaries" (Schein, 2013a, p. 17). When trying to foster more collaborative ways of interacting at vertical interfaces, the action researcher (or the enabling leader) poses "good questions that help to enlarge possible worlds and possible ways of being in a relationship" (Hosking, 2004, p. 270). A good question can be the start of an extraordinary conversation.

Suppressive responsive processes can now be defined as processes that suppress inquiry and suppress the possibility of other worlds and relationships existing. Creative responsive processes can be defined as processes that provide intriguing answers to good questions, thus opening up possible worlds and possible ways of being in a relationship. A creative responsive process enacts a transformation in the form of a new definition of the situation, of the relationships between the people involved, and of the personal choices each makes with respect to the situation and relationship.

Interaction Rules

What people do next is just as much determined by the patterns of interaction they are engaged in as by the act of naming X. It is the interaction pattern that allows for or suppresses an inquiry into X in the first place. In search of a full-process approach, the literature review revealed five interaction rules that apply as much to the action researcher as to the members of the organization: (1) when change is needed, connect to local interactions (Stacey, 2012); (2) when you are interdependent on the knowledge of others, engage in humble inquiry (Schein, 2013a); (3) when the administrative-hierarchical approach is counterproductive, pose good questions that help to enlarge possible worlds and possible ways of being in a relationship (Hosking, 2004); (4) when the generation of shared purpose is an ongoing task, invite diverse people throughout the organization to reflect on the strategic direction, and, by highlighting issues from their perspective, to contribute to its reformulation (Adler & Heckscher, 2006); and (5) when reality is threatening, provide a holding environment that enables people to

contain tensions and anxieties (Vansina-Cobbaert, 2008). Since we have already discussed interaction rules 2 and 3, we will now discuss rules 1, 4, and 5.

The first rule approaches interaction as a complex responsive process, that is, a conversation in which people negotiate meaning, stabilize, or change power relations and make choices that reflect their action theories (Stacey, 2012). The term "responsive" refers to the way human beings, like all higher mammals, relate to each other in a responsive way, with a gesture by one evoking a response from another in a conversation of gestures. This concept goes back to the sociologist Mead. Gesture and response together constitute a social act in which meaning arises for both, so that knowing is a property of interaction or a relationship. Meaning does not lie in the gesture alone but in the social act as a whole: meaning arises in the responsive social interaction between actors. Organizations emerge as patterns of interaction involving many, many local interactions between members of an organization and between them and members of other organizations, such as suppliers, consumers, competitors, regulators, and governments (Stacey, 2012).

From this perspective, action research can be said to introduce a double-layered responsive process. The first layer adds the "gesture" of inquiry to the interactions of the stakeholders in relation to the felt difficulty. The second layer adds a pause to reflect on what happens while the inquiry is ongoing. Both are possible because the human body lets people gesture to others in a manner that is capable of *evoking in themselves* the same range of responses as in those to whom they are gesturing (Stacey, 2012). Significant gestures make it possible for the gesturer to "know" what he or she is doing; one is able to experience in one's own body a similar response to that which the gesture provokes in another body. One is conscious and can intuit something about the range of likely responses from the other. Hosking defines the reverse situation: conversations will be incoherent when people position themselves apart from the whole, when they try to understand wholeness through abstract thought, and when they hold on to fixed positions (Hosking & Shamir, 2012, p. 469).

The fourth rule is based in the idea that in the last few decades a new and possibly higher form of community has been emerging. Adler and Heckscher (2006, p. 12) argue that capitalist development corrodes traditional forms of community, but also stimulates significant progress toward a new form of community, because of the demands for complex, knowledge-based, and solutions-oriented production. They call this new form *collaborative community* and state that it points the way beyond the

classic antinomy of individual versus collective, of tradition versus freedom, of Gemeinschaft versus Gesellschaft, by offering a framework for trust in dynamic and diverse relationships and reconciling greater degrees of solidarity and autonomy. The collaborative community is characterized by an ethic of interdependent contribution and requires new ways of organizing. "Collaborative community in modern industry needs to coordinate interactions that span a wide range of competencies and knowledge bases, and that shift constantly to accommodate the evolving nature of knowledge projects. (…) Process management coordinates large, diverse communities and high levels of complexity. (…) with strong accountability and where accountability is not only hierarchical" (Adler & Heckscher, 2006, p. 44).

Among other things, interdependent process management requires processes for building a shared sense of purpose, what we have called the strategic process. As generating a shared purpose becomes an ongoing task rather than a fixed origin, a growing number of firms are involving lower layers in a more "dialogic" and collaborative strategy formulation process to make sure that employees at all levels understand the competition, customer needs, and strategic challenges. Two basic types of processes around purpose can be distinguished. The first process is the development of widespread understanding of the strategy, with discussion mainly aimed at clarifying and building commitment to it. The second type of processes closes the loop: inviting diverse people throughout the organization to reflect on the strategic direction and, by highlighting issues from their perspective, to contribute to its formulation (Adler & Heckscher, 2006, p. 47). We have taken this second type of process around purpose as interaction rule 4.

Interaction rule 5 states that enabling collaborative interaction at agility-critical interfaces requires a holding environment that enables people to contain tensions and anxieties. A person acts as an efficient container when she or he "manages to stay calm under stressful conditions, while the people who are emotionally upset or anxious can feel his/her honest concern and orientation towards solving the difficulties at hand" (Vansina-Cobbaert, 2008, p. 60). "Holding is providing for the maximum protection against disturbing intrusions from outside (…) while each participant knows his/her personal task in the overall procedure" (*ibid.*, 61). If something unexpected should happen, leading members "decide on the necessary action, thereby absorbing – containing – the upsurge of anxiety in the rest of the team" (…) "and the team will not fall apart" (…) "because they know from experience that they are capable of absorbing unforeseen

difficulties and responsibilities without collapsing" (*ibid.*). From a relational point of view, those members who fulfill this containing function will be leading, and they may include the manager, a knowledge worker, or the action researcher.

Summary

Interaction patterns refer to the way human beings communicate with each other, make choices, and regulate their power relations. So a transformation of leadership dynamics at agility-critical interfaces will involve a change in the meanings communicated, the power relationships entertained, and the choices enacted at these interfaces. Conversations during which this transformation happens are extraordinary conversations. In these conversations, a change in leadership dynamics emerges as a new interaction pattern between administrative, adaptive, and enabling leadership roles. Enabling leadership mediates between administrative and adaptive leadership roles with the help of five interaction rules. This chapter will examine the rules of interaction that were applied in extraordinary conversations that took place during four action research projects and two intermezzos. We are in search of interaction rules that promote collaborative ways of relating at vertical interfaces to enable organizational learning and adaptation.

ACTION RESEARCH AS METHODOLOGY

This is a multiple case study of four action research projects and two interview projects executed in a business context that evolved over a period of 25 years. Fig. 6 presents the timeline of these studies.

The rationale for choosing the action research methodology lies in the dual purpose of effecting changes in leadership dynamics at hierarchical interfaces and generating actionable knowledge that is implementable beyond the local situation. Involving the people that work at a hierarchical interface in changing it will produce more sustainable change, better learning, and more valid data about how this interface really works.

However, a collaborative inquiry process in a local situation is not sufficient to qualify as action research. Action research is a formal effort to locate the work both in a practical and an academic context.

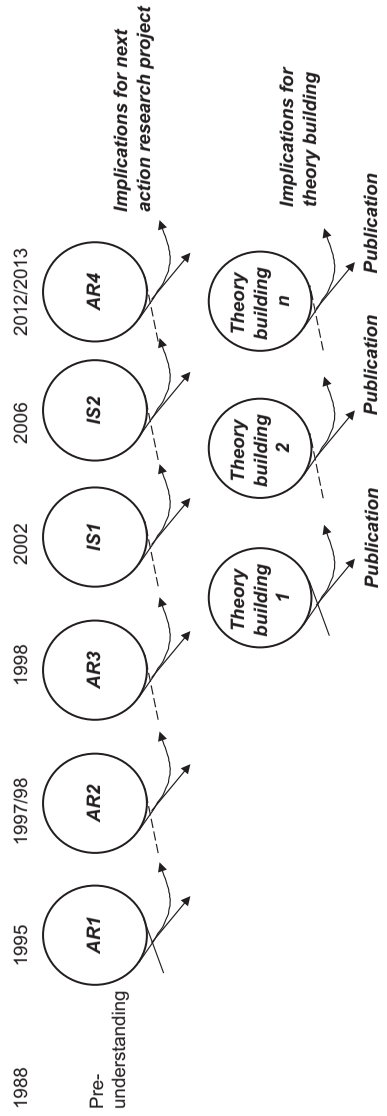

Fig. 6. Timeline of the Studies. AR, Action Research Project; IS, Interview Study.

Action Research as Boundary-Crossing Between Four Arenas

Schuiling (2001) distinguishes four arenas for knowledge development in OD: the local unit that is undertaking a planned change effort with help of an OD practitioner; the firm of which this unit is a part and in which the internal OD practitioner (IODP) is positioned somewhere; the community of OD colleagues; and the academic community. Knowledge is not only produced in the academic context and then transported to the three other arenas. Knowledge is generated in every arena and can be transported to the other arenas. Every arena, however, has different orientations and success criteria with regard to learning and knowing. In arena 1, the quality of action research is defined in impact terms such as organizational effectiveness and increase of competences. In arena 4, the quality of action research is defined in process terms such as rigorous, reflective, and relevant (Pasmore, Woodman, & Simmons, 2008).

The action researcher has co-learners in every arena and can invite them to join him in crossing the boundaries to the other arenas (Vermaak, 2009). Instead of integrating the four types of activities into one monolithic endeavor, the tensions between the contrasting orientations can be utilized by loosely coupling divergent types of action research of which there are many available (Vermaak, 2013). In arena 1, the action research was of the types survey feedback (Mann, 1957/1961) and clinical inquiry (Schein, 1987). Arena 4 used the frameworks of action-integrated case study (Van der Zwaan, 1995, p. 99), with its combination of imagination and scientific rigor, and multiple case study (Eisenhardt, 1989), with its combination of "within-case analysis" and "cross-case analysis."

In arena 2, the cross-case analysis of the first three action research projects was discussed in 2001–2002 with the CEO, a business group director, and several people who participated in action research project 3. These discussions were sympathetic to the concept of responsiveness as key for adaptive coping, but did not develop any new insights or research questions.

In arena 3, the measurement of personal development was discussed in a conference of the Dutch Association for Action Learning in 2002. The full-process model evolved in discussions with colleagues from OD, MD, and organizational design (Schuiling & Heine, 2005).

Data Gathering

OD's double focus of improving organizational effectiveness and amplifying the learning and competence of those involved (Pasmore & Fagans,

1992; Porras & Robertson, 1987; Quinn, 1988) required generating data on organizational effectiveness and on individual competence. The first three action research projects collected survey data, record data, and clinical data. All data were first fed back into the inquiring activities in arena 1 and then processed in the research activities in arena 4. The fourth action research project (AR4) only collected clinical data.

In the intimidation interview project in 2002, the researcher's role was a personal initiative on the part of the IODP since he felt the intimidation event to be directly relevant to the hierarchy puzzle and to be a potential source of new material that could help to further develop insights with respect to the relation between organizational design and leadership dynamics. The interview was negotiated with every interview respondent. Producing a publication after a first round of interviews that was then read by fresh interviewees in the second round of interviews ensured that the research process was rigorous and reflective. This procedure was repeated in a third round of interviews. In this way the reliability and relevance of the data were validated and the reflection was enriched.

In the self-managing plant interview project in 2006–2007, the role of researcher was initiated by the EODP as this self-managing plant could potentially be another part of the solution of the hierarchy puzzle. The research role was negotiated with both the plant manager and the production manager. The production manager negotiated the participation of the operators in the interviews. The research process was made rigorous, reflective, and relevant by discussing the drafts of publications with the managers and by inviting operators to conferences to share their experiences with a larger audience of researchers, consultants, and managers.

Structure of the Account

There are only few longitudinal studies of OD, mostly focusing on the impact of one intervention. Roth, Shani, and Leary (2007) provide an example for an account of a series of different interventions that offers many details in the form of tables only. We followed this example by producing four tables. The Appendix provides an overview of the sequence of OD interventions in the case under study. Table 1 provides a comparative summary of the four interventions that qualify as action research projects. The core of the argument in terms of interaction rules and their impact on agility is summarized in Table 2 and will be discussed in the result section. Table 3 clusters the found interaction rules per interaction partner, and is also discussed in the result section.

The vertical axis of Table 1 builds on Coghlan and Shani's proposal (2013) to judge the quality of action research on such factors as assessment of context, collaborative relationships between researchers and members of the system, the action research process, and the way the dual outcomes reflect some level of sustainability.

The triangulation of the outcomes of all six studies produced the insights of this longitudinal case study. The intimidation interview project provided the motivation for the action researcher to renew the conceptual framework he had used in his dissertation (Schuiling, 2001), which has been summarized in the section on the research question. The four action research projects and the self-managing teams interview project are presented in chronological order. Action research starts with a pre-understanding and results in theory (Eden & Huxham, 1996). In a series of action research projects, the pre-understanding of one action research project is based on experiences and knowledge generated in the previous action research project. Consequently, each of the studies follows the replication logic of scientific research that Eisenhardt (1989) details for multiple case studies.

AR1: THE REDESIGN PROJECT

This first action research project is the initiation, application, and evaluation of the approach for the collaborative redesign of the enzymes plant of Gist-brocades in Bruges in 1995. Collaborative redesign helped to restore the operating agility of the plant because of its combination of cost reduction with empowerment of both operators and managers.

ABX Dynamics

In the summer of 1994, the IODP was requested to do a diagnostic inquiry by interviewing the middle managers of the plant and searching for a Belgium trainer of a "horizontal management" training program. At the same time a taskforce, named "Claire," tried to achieve a cost reduction of 20%, as a corporate audit had concluded that the plant was less cost-effective than the competition. Initially, both the general manager and the HR manager assigned the two objectives to two different projects, as if a cost reduction of this magnitude could be achieved without structural changes and "horizontal management" was only a matter of skills. The IODP addressed the HR manager on this splitting of financial and people

issues. He reported that the production managers felt like "foolish puppets on a string" as they had no authority to act on issues the shift supervisors brought to them and had to consult with the production director first, who, as they complained, was always in a meeting. The IODP proposed a structural change by removing management layers as a first step toward horizontal management. The HR manager did not want to consider this suggestion. He said he had been intervening on hierarchical interaction patterns from the start and had managed to generate some collaborative relationships with young managers (the ones now participating in the Claire taskforce), but was still insecure about how to address senior management. He instructed the IODP to look for a trainer first. The IODP, though knowing a training program would not be an effective way to achieve horizontal management, stepped into his car and went in search of a Belgium trainer.

After six months, the problem definition had evolved to "how to reduce operating costs by 20% in such a way that we don't destroy the organization and empower the operators and middle managers at the same time?" The IODP enabled this shift when the two managers rejected the two trainers he had introduced to them because both failed to clarify "how the training would help to make the change happen." He then concluded that both managers did not need a trainer but rather a change consultant who also knew about learning. He then introduced Lee Vansina, a Belgium OD consultant who has a reputation of being able to achieve transformative change by participation. Vansina was awarded the assignment to help the change team, now named "Claire 2," to redesign the whole organization, starting with the flow of the production process.

Design of Learning Mechanisms

The external OD consultant delivered three contributions. First, he brought his expertise on socio-technical systems design to bear. His metaphor of the flow for the manufacturing process turned out to function as a cognitive learning mechanism for the change team. Second, he structured the redesign process into three successive rounds of participation for people of all functions and layers. This structure turned the redesign process into a structural learning mechanism for all people in the plant. Third, he produced relational learning by using his psychodynamic expertise in helping people to work through a threatening reality. This provided for the changing leadership dynamics that we will now describe in more detail.

Invitation to Participate Produces an Extraordinary Question

An extraordinary conversation took place at the start of the second round of participation. The redesign team invited about 16 employees (shift supervisors, engineers, planners, process specialists, and maintenance staff) to a meeting. They invited these people to check whether their plan to redesign the organization was feasible and, assuming that was the case, asked them if they would be willing to detail it further. This invitation opened a new way of being in relationship. One of the questions of the sixteen employees was: "Are you asking us to build our own coffin?" The HR manager replied: "The objective to become competitive again cannot be achieved without a loss of jobs. And taking part in the study groups is no guarantee of securing your own job." The external OD consultant added: "We need your help in creating an organization that has a future." A bit later the next question was: "Are we free to discuss everything we discuss in the study groups with our colleagues in the plant?" The HR manager replied: "Yes, sure. We appreciate your doing that in order to validate your own opinion and knowledge with any colleague you want." And the last question was: "Is this an order or an invitation?" The external consultant replied: "This is an invitation, so you may say 'no'." This meeting took place on Friday afternoon and the study groups were due to start on Monday. Some employees did not sleep the whole weekend, having to make this personal decision to participate or not. On Monday everyone was there (Schuiling, 2001).

This personal decision process from Friday to Monday changed the relationship between management and workers fundamentally, as became clear in the interviews after the implementation of the changes. As one of the 16 – also a union representative – remarked: "Because participation was voluntary, I felt I could bring in my union background. I felt that they were honest in their redesign efforts."

In his study of this case, Vansina (2008, p. 368) qualifies the "coffin-question" as "seemingly rhetorical." Schuiling (2001, p. 130) interprets it as a sense-making question: probing for the intention behind the invitation to participate, checking whether management acknowledges the conflicting interests of the employees. The answer, that participation was a choice, keeps tension in the system by turning the decision to take responsibility for the future of the plant into a felt difficulty of the employees. Building on this interpretation, one could say that a reciprocal interplay between the hermeneutics of management and the hermeneutics of the workers is redefining leadership relationships in the evolving and expanding ABX system of the redesign process. Apparently *inviting* people to collaborate

opens up return-invitations as a responsive process – however ambivalently phrased.

Extraordinary Conversation as Result of a Question That Expresses Own Embarrassment

The second extraordinary conversation took place in the Claire 2 redesign team two days after the news is made public that Gist-brocades has sold the plant to Genencor International (Schuiling, 2001). *The employees in the plant reacted enthusiastically to this news by pulling down the Dutch flag, raising the American flag, and congratulating one another with this day that "the Americans liberated us from the Dutch." The meeting of the change team started at 8 a.m. and when the Dutch IODP arrived, the Dutch HR manager walked him to the meeting room and told him that the (mostly Belgian) redesign team was in doubt about whether to stop the change process or to continue it. There was an indeterminate atmosphere in the meeting. The IODP suggested that the team discuss the following question: "For three months many people have worked hard to make a change plan for this plant. But in the meantime, others have apparently been working hard to sell this plant and the whole industrial enzymes business to Genencor. I work at corporate headquarters, but heard about it this week, just like you. What do you now feel to be the meaning of all our redesign efforts in the light of this new information?" This question produced a highly interactive and intimate conversation that expressed their growing self-confidence as a team. The meaning of the redesign effort was first defined as "having learned more than in any training program before." Then one of the employees said the following: "Our having drawn up a complete change plan ourselves helps me feel like a partner of the new American owner of this plant when discussing his plans for the future." The rest of the team supported this statement of identity as a partner of the new owner.*

This conversation convinced the IODP that a real transformation had happened, compared with the pattern of "foolish puppets on a string" middle managers had complained about in the diagnostic inquiry a year earlier. An intimate part of the conversation came when the members of the change team asked the general manager how long he had already known about the senior management's plan and what future position had been offered to him. He replied that he had been transferred to the new owners without his consent. His honesty added to the growing trust in each other to continue the change project.

When the deliberations with the Americans about the redesign plan were done, the Americans approved the redesign, adding some insights of their own, and decided to invest in a new process technology. Half of the staff lost their jobs. A reduction of 47% of the fixed costs was calculated a year later. It is impossible to assess the relative impact on the operating costs of the collaborative redesign approach, compared with the introduction of the new technology and the changes in the work organization.

Leadership Dynamics

One should however not think lightly about the deep emotional struggle collaborative interaction rules evoke in workers when their jobs and relations are at stake. People of all functions and all layers experience the full ambivalence of the change. Collaborative redesign deeply unsettles a relationship that constructs a split between two identities, that is, between "management is responsible for economic results" and "we, the rank and file, are responsible for doing the work."

Vansina (2008, p. 369) describes the psychodynamic dimension of collaborative redesign in this case as follows: On the one hand workers "experienced that they could work together across functional and hierarchical differences in the here-and-now of the study groups. But they also became aware that less people were needed to do the work and that the remaining work would demand different skills and attitudes. In other words, the members came to see an emerging reality that was liked and feared at the same time; a reality of which they were part as someone whose role was changed, made uncertain, or was painfully removed from the scene. They were presented with pictures that they emotionally did not want to accept but which they rationally understood to make sense. Splitting the emotional from the rational, in order to project the rational part to management, could not be sustained because it was also their idea and made sense to them, too. Yet, the concern of keeping one's job or one's employment was there too. At the same time, however, no change at all was not an alternative. In the long run, it would lead to more severe consequences."

On a more concrete level the following facts must be mentioned. The American owner promoted most members of Claire 2 to management positions. Of the old management team, only one member kept his job. An almost complete change in leadership had therefore taken place as an effect of the collaborative redesign. It was also the first time in history that a Belgian person was appointed as general manager of this plant. Though he

was not successful for very long, his successor was also Belgian. This successor managed the next downsizing of the plant in an even better way, paying more attention to the emotions of the people who were leaving as well as those who were staying.

Articulation of Interaction Rules

In the intimidation study the interaction rule-in-use was: "When reality is threatening, forbid people from bringing forward valid information that questions the assumptions of the current strategy." In this action research project, a rather different rule is used: "When reality is threatening, provide and ask for valid information to enable everyone to understand fully the situation and be honest about conflicting interests; and allow everyone a personal choice whether or not to collaborate in the change." And one can add the following rule: "Even when objectives and interests conflict, invite diverse people throughout the organization to reflect on the strategic direction." Table 2 lists six rules that can be distilled from this case, together with their impact on leadership dynamics at the agility-critical interfaces.

Twenty years later, these newly found rules are still so unique that it is worthwhile discussing them a bit further by bringing forward the insights Vansina generated about this action research project. Vansina states that the process and the outcomes of this case prove false the popular theory that conflicting interests are a counter-indication for participative decision-making (Vansina, 2008, pp. 378/385). This theory basically defines a stop-interaction rule: Managers should stop interacting with employees as partners in a decision-making process when the interests of employees and organization conflict. This is based on the assumption that manager's interests equal those of the organization while employees only think about their own interests. The manager should thus solely operate on behalf of the good of the organization. This theory legitimizes managers to respond to employees with interaction rules like (a) provide "them" with more information about the necessity of the change; (b) trade favors; or (c) just listen to their objections. This case shows that employees also think about what is good for the organization and are willing to provide valuable operational know-how for a redesign of the manufacturing process that will cost jobs, but which will also secure a future for their plant. This case shows that managers can invite people to the table who bring a diversity of interests, objectives and know-how that enrich the quality of the

thinking process. Vansina concludes that the time has come to drop the notion of participation in favor of collaboration: The concept of collaboration "seems to provide a much richer perspective for gaining an understanding of organizational and community realities" as "organizations are becoming more and more changing constellations of different interest groups having their own perspectives, like subcontractors, co-makers, preferred suppliers, employees of different kinds, and key customers" (Vansina, 2008, p. 385).

With this notion of collaboration, the IODP started two new action research projects in Delft, in the heart of a culture that was both entrepreneurial and intimidating, and thus providing a good research setting for the newly found interaction rules.

AR2: THE BUILDING ON STRENGTH PROJECT

The second action research project is the initiation, design, and application of a training program for the high potentials of Gist-brocades. Design started in 1996 and the pilot took place in 1998 – during the integration of Gb into the new company. The program helped to improve entrepreneurial agility through a combination of personal development with dialogs between participants and senior managers of all functions and levels.

The ABX Dynamics

In 1995, the CEO appointed a new corporate HR manager in charge of three specialists: MD, OD, and expatriation. He liked the Vorstman model, but was worried that the flat management structure and the high responsibilities for entrepreneurs demanded too much from people. To provide support, he asked the IODP in 1996 to design training programs for the four levels of the company: professionals, managers, entrepreneurs, and leaders. They discussed a first sketch with the CEO. He liked their management development model, but did not want to approve the development of training programs, as there were many more important things to do. When they left his office the HR director said to the IODP: "We are going to do this anyway." The IODP's answered: "Ok, I'll find a way to get this going without his support." It took two years to create a taskforce, design the first program and develop the political support with the key stakeholders in

the company. However, these were two fruitful years as the IODP grew in his conviction that interaction patterns, not individual skills, need to be the focus of the new program. In the design phase, managers of all levels define high expectations with regard to the assertiveness and independence of professionals "who should give unsolicited advice" to managers and dare to stand up to senior managers and "stop behaving like a waiter who delivers to orders." Professionals, however, say that while they like the freedom and variety of their work, they miss structure and protection: "Management stimulates people to be entrepreneurial but wipes your ideas from the table when they don't fit in with their plans." How can training help change this interaction pattern, such that both the professionals and the managers learn from the training?

Design of Learning Mechanisms

The purpose of the program is to improve collaboration at the interfaces between different functions and layers. This training program is a structural learning mechanism as it secures the space and time to build a temporary learning community in which the participating professionals and managers – as partners in a dialog – enhance each other's competences by reflecting on the experiences they have gained working together in setting and achieving business goals. The sequence of activities is based on the assumption that, when the reflection of the professionals on their personal development precedes and concludes the dialogs with managers, this will increase the professional's competences in interacting across functions and levels. This assumption is based on Bandura's concept of individual self-regulation, which states that people observe their own behavior while interacting with others, compare this with own norms and goals, and correct own behavior to achieve these goals (Bandura, 1986).

To enable participants to reflect on their personal development, Daniel Ofman was the only external trainer selected to contribute his model of core quadrants to the program (Ofman, 1996). With the help of this cognitive learning mechanism, participants identified their core qualities, pitfalls, irritations, and challenges in the first two days of the program and made a personal development plan at the end of the program. In the interim, there were two days of dialogs and discussions with managers. The discussion with Gb's CEO opened this cross-level dialog in the pilot.

Extraordinary Conversations

The message Gb's CEO always gave (new) employees was: "Stand your ground," "Present your case," and "Don't take no for an answer." All values from the culture change program of 1991/1992 are still in place. More specifically, the interaction rule he espoused was: "When you have a good idea, present it to your boss. If he rejects it and you still believe your idea is good, don't take no for an answer and go to the boss of your boss, if possible together with your boss. Go all the way until either you find out your idea is not that good or you get support for it" (see Table 2).

In the pilot version of *Building on Strength*, the CEO is scheduled to appear in the evening of the second day of a five-day program, on the assumption that participants would by then have developed the assertiveness and the team spirit to confront the CEO with their own ideas. The CEO, however, dominated the whole discussion, even when making a process intervention after about an hour (Schuiling, 2001, p. 175):

CEO:	*"Why are you only asking questions and making remarks? I like my people to be more aggressive, to have the drive to fight for something."*
One participant (of the anti-infectives division):	*"That is exactly the problem of this company."*
CEO:	*"What is the problem of this company?"*
Same participant:	*"The aggressive behavior of managers in the top. That really bothers us tremendously."*
CEO (vehemently):	*"There is no aggressive behavior in the top of this company!"*
Participant:	*"There is."*
CEO:	*"There is not!"*
IODP:	*"He feels there is."*
CEO:	*"I don't." (Schuiling, 2001, p. 175)*

Then this confrontational inquiry comes to a halt. The conversation continues, with an attempt somewhat later to critique the lack of information professionals receive about decisions of their divisional management teams. CEO: "Ok, that's an error of the management team. But if you really need that information, why don't you approach the team and ask for it?" This

confrontation with their own responsibility was accepted with some ill feeling as "throwing back the ball." Nevertheless, there was much energy in the discussion, and the meeting ended well in good spirits. However, the next morning there was a mutiny at all the breakfast tables: "He did not listen to us," "He pushed our issues from the table," and so on. As a result the participating professionals were a lot more assertive with all the senior managers who came along that day and had some really good dialogs. In the final discussion, a mutual understanding was reached, when the participating divisional director concluded: "We senior managers made some mistakes in how we communicated, but if you want to be heard you need to develop the skills not to be brushed from the table." And the professionals concluded: "It is not enough to base responsibility for communication only on the shoulders of the individual employee; management has to create systems and procedures in which information is provided and judged". In the light of this conclusion, the merger was welcomed as the promise of bringing those systems and structures.

Back in the office the next week, the IODP met the CEO. The CEO said he had heard it had been a great week. The IODP answered: "Yes, except your part of the program." And then an extraordinary conversation evolved when the CEO asked: "What is their critique of me?" and the IODP answered: "I don't want to speak on their behalf, but I can tell you what I recognize from my own experiences." They took the time to reflect on what had happened in the pre-phase of the program, when the CEO did not want to give his support at first. In the end, the CEO asked whether there was a second session and if he would be welcome to discuss with the participants what had gone wrong. The participants appreciated this gesture and explained to him what in his behavior and stories had given them the feeling he was not taking them seriously. A Portuguese product manager explained that he criticized the CEO's shareholder value orientation in the first module, with the CEO reacting that the product manager defined the concept of shareholder value wrongly. The content and style of this reaction had given the product manager the impression that people don't matter to the CEO. The CEO accepted this criticism, saying this had not been his intention. He listens without directly passing on judgments.

Leadership Dynamics

The existing power play between Gb's professionals and managers is that managers refer to the personal responsibility of the professional every

time professionals analyze the functioning of the organization. As a result, professionals have developed some economy of balance between their sympathy for the norm that managers and professionals should be full partners in honest conversations about the business, the experience that this norm is often violated, and the protest feelings resulting from this violation.[7] The Building on Strength program allowed them to rework this emotional economy by sharing their anger among themselves and finding a way to feedback their experience to senior managers. Perceiving, discussing, and changing the interaction pattern of "being brushed from the table/letting oneself to be brushed from the table" was the collaborative learning process that evolved because of the failure of the first discussion with the CEO. The professionals learned to communicate both their business ideas and their feelings about the interaction with a senior manager. Senior managers learned how their ideas and styles impacted others. And the training staff learned that this power-and-emotion dimension is an integral part of learning to collaborate at vertical interfaces and designed more space for reflection on it in the following editions of the program. Senior management was very enthusiast about these dialogs with high potentials and the program ran about 18 times in the new company until 2008.

Articulation of Interaction Rules

The interaction rules as practiced by the CEO in this case shift from "When people make statements that challenge your way of being in a hierarchical relationship, simply deny that their statement is true" to "When you are criticized, connect with the people who have criticisms, even when you are the CEO and the critics work several management levels below you." This shift was not the result of a sudden personality change of the CEO, but resulted from the structural, cognitive, and relational learning mechanisms of the program. The five interaction rules that together make up the relational learning mechanism of this action research project can be found in Table 2.

As this was an encouraging result, the IODP applied the same interaction rules in the following action research program. Specifically he was interested in the following question: What would provide for a holding environment to work through the emotional balance economy in the anti-infectiva division itself?

AR3: THE WORK STRESS PROJECT

The purpose of this third action research project was to find the causes of and solutions for the stress experienced by the people of the R&D unit of the anti-infectives division. The time span of the project was 1998–1999. The department had 110 employees, of whom 105 participated in the project. The management team of the department, together with the IODP, acted as the inquiry group. The project helped to improve innovating agility by changing the interaction patterns within the R&D department, but could not change interactions at the interface between the innovation process and the strategic process, that is, between R&D and the division's management team.

ABX Dynamics

A line manager of the R&D unit introduced the IODP to the R&D director. The latter was not sure there really was a problem: complaining about stress might be just a conversational routine. The three of them negotiated the following research questions: Is the level of stress higher than usual? To what extent do organizational factors contribute to stress? To what extent do individual skills (or the lack of them) contribute to stress?

When a survey indicated the level of stress in the department was significantly above the average for the Netherlands, the inquiry group decided to organize a conference of the whole department. This meeting was experienced as a release of tension and was extended by another day in order to develop solutions. An interim measurement showed a significant reduction of stress, a significant increase of satisfaction and some increase of self-efficacy in skills that are critical for coping with stress. But the measurement also showed that the level of stress as experienced by the members of the MT had significantly increased, except for the director, who again in the survey reported the lowest levels of stress of everyone in the department. This initiated a self-inquiry into the MT dynamics with help of the IODP. The follow-up project was terminated by the R&D director when this self-inquiry stagnated.

Design of Learning Mechanisms

The structural learning mechanism is the process of collaborative redesign applied in a sequence of alternating large and small group meetings, while

continuously changing the composition of the small group.[8] So there is first a large group meeting with the whole department lasting one-and-a-half hours. The research team reports the outcomes of the survey and proposes to have a conference with the whole department to analyze the causes and to develop solutions. This proposal meets with strong resistance of older employees who say they had a conference some years ago with honest conversations that had a destructive effect on their careers. Young employees, however, say they are hindered by stress as well and want to use this new opportunity to do something about it. The older employees engage with the young employees and agree to participate in the conference on the condition that the small groups will not be facilitated by people from the HR-department. This departmental meeting is followed a few weeks later by small discipline-based group meetings to analyze the survey results in the light of the relevant discipline, with help of the IODP. Again a few weeks later a large group meeting of the whole department is held. It starts with the disciplines reporting their analysis of the survey results. Next, small role-based groups analyze the causes of stress from the perspective of their functional role. These small groups present their functional role analyses in the large group meeting, which results in defining a shared problem analysis.

After the first conference day, this problem analysis is checked in all project teams and in the management team. At the second conference day all teams present their findings in a plenary session. Then task forces are created to detail solutions for organizational stress. These task forces start their work at this second conference day and continue it afterwards.

The survey functions as a cognitive learning mechanism as it develops a model of the causal links between workload and stress, mediated by both organizational factors and individual skills. This model captures all significant correlations that have appeared in the survey. Support by management is for instance an organizational factor that can alleviate the impact of workload on stress. The satisfaction of the scientists and analysts with the support by management is however low. The reasoning based on valid data then is: If management provided more support, this would reduce the stress of the employees. This reasoning changed the action theories of the participating managers and contributed to their higher levels of stress reported in the follow-up measurement. They performed a lot of extra work in providing support to employees and did not receive any themselves from their director.

Extraordinary Conversation in the First Conference Day

When the groups based on functional roles returned to the plenary room, they shared their stress experience with the other groups. Secretaries reported feeling like the garbage can of the department. Quality coordinators explained why they had the highest score on the stress indicator "emotional exhaustion." Project managers reported they had high scores on many stress indicators and that it would help them if the director gave them more confidence and support in the divisional management team. Analysts said they knew they could say "no" to a new assignment, but that they did not receive an exploring response when they did so. Scientists also said they found it difficult to make agreements: Were professional considerations being taken seriously or were business targets sacred? Each report was followed by feedback from others in the room, helped by questions like: "What do you see quality coordinators do when they feel emotionally exhausted?"

This responsive reflection seemed to fulfill a need as this part of the program took twice as much time as planned and they did not want to stop it. The role reports and the reflective feedback of colleagues were significant gestures in a process of organizational learning. People evoked in themselves the same range of responses as in those to whom they were gesturing, thus becoming aware what they were doing to each other.

The large group then drew the diagnostic conclusion that the whole system worked by passing on the pressures from the business via the project managers to the scientists and the analysts, and then to the secretaries and the quality coordinators. This resulted in coercive planning and a lack of personal attention. The IODP observed that the reports of the discipline groups were playful and humorous, while a heavy mood developed during the plenary reflection on the reports of the functional groups. This led to a further discussion on the theme of coercive planning (Schuiling, 2001, p. 223).

Maybe the growing awareness of how the system worked by passing on pressures had a depressing effect as it proved false the perception of a department divided between managers that pressurized and employees that were being pressurized. Something really changed in the room when the project managers reported their high levels of stress as shown in the survey.

Extraordinary Conversation in the Second Conference Day

In the second meeting, the project teams reported how the stress expressed itself in their team, resulting in the definition of four themes for

improvement. When it is the turn of the management team to report how the stress expressed itself in their team, the following conversation evolved (Schuiling, 2001, p. 224).

MT member (a project manager):	*"I have been too busy to prepare this presentation and, as we had agreed on the first conference day, one may say 'no' when one is fully booked."*
An analyst (expressing the surprise in the room):	*"You interpret that rule too easily. Why didn't you ask a colleague to take over?"*
The MT member:	*"I did. He had no time either. Together we went to the director to give back this assignment to report at this conference."*
Analyst:	*(expressing growing irritation in the room) "Did the director accept this? And why did you do it? Why don't you improvise your report just here and now? You are showing a lack of respect for us by not telling us about the discussion in the management team."*
R&D director steps forward:	*"The discussion in the management team focused on my style of leadership: too strict, too business-like, too cold, too insensitive. But happily they did not deny my sense of humor."*

After this revelation the large group focused on sharpening the "say-no" rule. Saying "no" to a request for extra work is legitimate when you explain why the task is too difficult to do in the time available.

Stagnation of an Extraordinary Conversation in the MT

During the self-inquiry of the management team, an intriguing analysis evolved that showed that the stress of the R&D project managers was rooted in the triadic relationship between project manager, business managers, and R&D director.

In the MT, the project managers described how business managers behaved nastily when the project was not on schedule or budget and how they, the project managers, did not feel protected by their R&D director, who gave

them "a second slap on the back." The director challenged them by saying six R&D project managers should be able to cope with one director, to which they answered the power asymmetry was too big. The inquiry stagnated. The IODP legitimized the need for protection, but the R&D director stated: "It's old culture when managers protect their own employees. Employees need to learn to cope with the heat of the market, as mediated by the business managers. And I am accountable for the output of this department, so I have to confront my project managers when they don't deliver up to plan."

The IODP was ambivalent about this theory of the director's job. He was in favor of dropping the paternalistic forms of containment, recognized the power of the collaborative form of containment by the two conferences, but did not see a way forward for the director and his MT to make the collaborative form a structural one.

Leadership Dynamics

The project managers worked at the interface between R&D and marketing and sales (M&S), an interface where the insecurity of R&D meets the insecurity of the market. Both are a given. There would be no need for research & development if one could predict with certainty the outcomes of projects. There would be no market if Gb's market leadership enabled Gb to force customers to buy their products. Project managers at this interface need to be competent in coping with these two insecurities. However, when we combine the knowledge acquired in the intimidation research project with the knowledge acquired in this action research project, the proposition can be formulated that by not being open about a potentially valid analysis of the changing world market, business managers shove the burden of their tensions to the R&D project managers. The implicit assumption was: When the R&D project managers deliver their projects as agreed, the business will be saved. Explication of this assumption was, however, impossible as it would have changed the power relations between M&S and R&D fundamentally. R&D could have said: "If our projects are assumed to save the business, then we *are* the business and we can stop letting ourselves be kicked around by M&S." Consequently, suppressive responsive processes continued in the leadership dynamics at the vertical interface between the R&D project managers and divisional management. The director's action theory of "standing the heat of the market" legitimized his choice not to help his project managers in containing their anger, frustration, and fears as a group. The process of small and large group meetings did, however,

help to change the leadership dynamics between project managers, scientists, and analysts.

Articulation of Interaction Rules

"Saying 'no' to a request for extra work is legitimate when you explain what makes the task so difficult to do in the time available." This is a new interaction rule generated by this action research project. The project further replicates the rules already found in the literature and in AR1 (see Table 2). These rules are distilled from situations that were organized as action research projects. Which rules did managers use later on, acting on their own? The intermezzo provides three interesting narratives about this question.

INTERMEZZO: EMERGENT CHANGE

This intermezzo will describe a transformation in the anti-infectives business from the intimidating leadership dynamics at vertical interfaces in the 1990s to the collaborative leadership dynamics that emerged in the 2000s. At stake is the business' innovative agility.

This transformation is intriguing for two reasons. First, it is fascinating to observe that an intimidating culture can produce a collaborative culture. Second, it is a humbling experience to see how managers and employees produce this transformation without any help of an OD practitioner or action researcher. Deep changes apparently emerge between planned interventions. This shows that an action researcher should use a multimethod approach. The emergent new leadership dynamics were only revealed after the action researcher had stepped out of his role and conducted a classical interview study. Interview studies can also help to build relationship and trust: without them action research project 4 would never have happened.

This section will describe three narratives that illustrate creative responsive processes at vertical interfaces in the period 1993–2006, one set during the Gb regime and two set after the merger of 1998. The narratives are also analyzed in terms of leadership dynamics and interaction rules. The concept of collaborative community (Adler & Heckscher, 2006) will be introduced as the main new theoretical implication and as the bridge toward action research project 4.

Narrative 1: Enabling Responses to Two Bottom-up Initiatives

The anti-infectives business unit produces various intermediates, which it sells to the pharmaceutical industry that markets the final products. Production process is therefore key. In 1993, one of Gb's genetic scientists read an article about a new patent of Merck and immediately saw its potential. He approached the responsible business manager and made an initial draft on his whiteboard for the alternative production process for 7-ADCA (an intermediate of the antibiotic cephalosporin). The core idea is to replace the chemical process by enzyme conversion. This is much more efficient, because the unit operations can be simplified considerably. It is also more environmentally friendly as it requires a much lower consumption of energy and solvents. The business manager – having been both a scientist and a production manager earlier in his career – understood the potential of this innovative idea and added his own knowledge to it. He gave the scientist a small budget for a number of trials. The results were promising. The two subsequently met with division management to propose applying for a license with Merck. During the first year and a half, the scientist did most of the work. In an interview in 2008 he looked back as follows:

> *Intellectually it was exciting, business-wise it was very ambitious, and socially it was stimulating. We were a group of pirates. We went right across the standing organization. External advisors are still talking about it. They helped us by testing. And here in Delft we have professionals who are alert to opportunities, enjoy sharing their knowledge and abilities with others, and who are not afraid to stick their necks out.* (Schuiling, 2008a)

In 1995, top management of Gist-brocades decided to have the new technology developed and applied for a subsidy from the government, as the development would be environmentally friendly. While the laboratories developed new strains, the price of antibiotics rapidly decreased in the world market. The price fell down from 21 to (eventually) seven dollars per unit of product. As we have seen, Gb decided to merge with a firm that is committed to investing in the building of a new plant based on the new technology. The Dutch Minister for Economic Affairs, Annemarie Jorritsma, opened the new plant in 2001. In that period, after many years of cost-driven reorganizations, all remaining old anti-infectives plants in Delft were being closed. The best people from these plants could be selected for the two new plants: the ZOR-F plant, which produces 7-ADCA, and the enzymes plant, which produces the enzymes that the ZOR-F needs for its enzymatic conversion.

The project team that designed the layout and the organization of the plants in 1999–2000 made the following design choices:

- *One team for fermentation and recovery (just like in Bruges);*
- *The central control room (CCR) in the middle of the two processes;*
- *Engineers work in the space across the CCR with a full-glass corridor in between;*
- *No team leaders (this is more radical than Bruges);*
- *Star-point roles: a group of five operators, one from each shift, responsible for policy aspects such as safety, technique, quality, technology, and personnel.*

Allocating the star-point roles to operators was more radical than what was advised in the Dutch socio-technical literature on self-managing teams, which allocates the star-point roles to members of the team of team leaders (see Van Amelsvoort & Scholtes, 2003, p. 96).

For Gb these design choices are a very radical departure from the way it organized production for 100 years in Delft. The initiative came from the project team that made the business case that a self-managing teams organization is the most cost-effective option and also feasible, as the best people from the closing plants could be selected. In the anti-infectives business of today, both these plants are recognized as the world's most advanced, in term of both technology and organization.

Narrative 2: An Extraordinary Question Generates a Creative Response to a Crisis

For all operators who started to work in the two plants, the formal structure of self-managing teams was new. Neither the project team nor the first production manager, however, had arranged any training or coaching in self-management. This omission was not immediately visible, as in the start-up situation the new plant was still managed as part of the whole building project, with a project manager and start-up leaders providing leadership. Though the start-up leaders were given the double task of starting up the plant and developing the self-managing teams, they played the boss with everyone else when they felt the start-up goals are at stake. When the new plant was up to specs, the start-up leaders left, after which the self-managing teams organization quickly collapsed. Production dropped, nothing seemed to work anymore, and managers didn't know what to do. There was growing pressure to appoint team leaders. The site manager however, maintained his

support for the concept of self-management and fought like a lion for two new production managers. The head office gave him a new manager for the ZOR-F plant.

The new manager focused on managing the interface plant/head office. In 2008, he said the following:

> *"The head office was on the phone every day. They had invested 100 million guilders and the plant was not performing as expected, so they wanted to know what was going on. I had no knowledge about pipes and pumps, but I did know about relationships in management. So I started to manage the interface between the inside and the outside of the plant. I joined the production teams for two months and spoke with every operator separately. I asked everyone: 'What do you expect from me?' They were surprised; no manager had ever asked this question before. One operator answered: 'Don't hinder us, just take care of managing headquarters so they don't breathe down our necks every hour and we have a little more peace to solve the internal problems.'"* (Schuiling, 2008a)

The manager agrees with this definition of his role. He further notices that the interface between the work done in daytime and the work done 24/7 is not managed.

> *"In the old organization, food and the washing of clothes were arranged by '9-to-5' people. The operators now had to do this themselves, which led to an enormous amount of irritation. Also, an engineer now had to deal with 40 operators instead of five team leaders. If he had explained something to one operator and that operator fell ill, another operator gave the wrong assignment and the test failed."* (Schuiling, 2008a)

To solve these two problems, one of the operators was appointed as coach of all five self-managing teams. This coaching role evolved in the period 2002 to 2005 to a new formal position with the name "operations expert." One of the operators appeared to be most suited for that role. He had the right background and the authority to confront people on their own behavior. Through him, people gained respect for each other. He was the oil in the machine.

The position of operations expert was not designed on the drawing board, but emerged as a creative response to the failure of the self-managing organization to perform from the start. The same person has fulfilled this role in the ZOR-F plant for 14 years and bridged the continuity with six subsequent production managers in that period.

It is an intriguing dialectic. The self-managing teams organization was designed by Gb people – who failed to make it work, but did protect it in a time of crisis – and made a success by two young managers, who came from the new mother company that by no means had a policy of creating self-managing organizations. Again, the concept of the space between seems appropriate: in the "space" between the old and the new company, the self-managing production organization began to flourish. This

in-between space allows for the freedom to experiment and also has the characteristic of a holding environment.

One final remarkable fact must be mentioned. Not one production manager at ZOR-F or the enzymes plant had any experience in managing a self-managing teams organization. Some even accepted the job not believing it would work. They learned to manage self-management here at these two plants. The plant was their teacher.

Narrative 3: Extraordinary Invitation During Strategic Offshoring Study

A good example of collaborative interaction at a vertical interface happens at the ZOR-F plant in 2006, when senior management of the mother company was doing a study to decide whether or not to offshore the ZOR-F production to China. The plant manager from 2004 to 2007 explained why he started to involve operators in the business strategic dialogue:

> *"I was enlisted for a two-day workshop, and then the study group of ten executives moved on without me, and many others. Apparently this is how it works. But it's not ideal. Instead of opposing myself, I decided to craft our own strategic scenarios. I thought that the best way to go about it was to involve everyone at the plant. Together with the operations expert, the engineers, and a group of operators, we developed four scenarios for the manufacturing part of the strategy. During a one-day meeting we spent an hour on it, very interactively. Afterwards, I sent these scenarios to the strategic study group. When the future of your work is threatened like this, people are down in the dumps. That's a normal process. By communicating about it early on, everyone can decide, to a certain extent, when to get on the emotional rollercoaster. If we had postponed communication until the Board of Directors had taken a decision, everyone would have been trapped in feelings of anxiety. The threat now no longer paralyzes us."* (Schuiling, 2008a)

Collaboration on the interface manufacturing process/strategy process meant mediating between the reality of the world market and the reality at the plant, both for the operators and managers. The plant manager crossed vertical boundaries by translating his own dissatisfaction of being excluded from the strategic study into involving the operators in the strategic dialogue. The operators answered his invitation and developed scenarios – such as closing the plant – that they hoped would never materialize, but which did make them aware of the reality of the world market and the choice the top of the company wanted to make. By doing so, the plant manager created a holding environment in which the fears the offshoring study incited were not allowed to grow exponentially, but were transposed into further improvement initiatives in a threatening time. Operators began to search the internet for data about the cost structure of the Chines competitors, to

get a feel for reality and to find cues for improvement initiatives at their own plant. One year later, the Board of Directors decided not to offshore the ZOR-F production. In 2011, the Board decided to lodge the anti-infectives business with these two plants in a joint venture with Sinochem, one of the largest companies in China.

Leadership Dynamics

In narrative 1, the scientist showed adaptive leadership by initiating a collaborative change movement toward an innovation of the production process and the business manager showed enabling leadership by encouraging and facilitating the adaptive initiative and by integrating it into the strategic process of the firm. The interaction between the two improved the innovative agility of Gb and resulted in a new-to-the-world technological innovation.

In narrative 2, the interim production manager enabled the adaptive coping of the operators by protecting them from the pressures of headquarters. The interaction between them improved the innovative agility of the new plant and resulted in a new-to-the-world innovation in organizational design.

In narrative 3, the production manager enabled the adaptive coping of the operators with a strategic study of senior management that potentially threatens their plant, jobs, and employment. Interestingly, he uses his own frustration of being excluded from the strategic study as an incentive to include the operators in the strategic dialogue, thus providing for an excellent opportunity for organizational learning. The interaction between them keeps the operating agility of the plant alive and results in a sustained effort to improve the productivity of the plant.

In the traditional model, senior management develops strategy, workers produce goods, and middle managers lead the workers in their daily work. The concept of self-managing teams breaks away from this traditional management model by creating responsibility and accountability of knowledge workers for their whole productive process. The essence is thus not fewer layers of management, as fewer vertical layers in itself is insufficient for real engagement of knowledge workers with their productive process. The British psychologist Miller points out that, despite or because of delayering, the psychological distance between shop floor and top has only increased (Miller, 1998). The pyramid with its many layers has become a steep pagoda with the top wrestling with the complex, often worldwide,

field of forces and shielding itself from the pain generated by constantly reorganizing people on the shop floor. On the other hand, people on the shop floor back away from the difficult decisions people at the top have to make.

Narratives 2 and 3 confirm that collaborative interaction on the vertical interface between the strategic process and the primary process is possible, that middle managers can have the courage to empathize with the anxieties on the shop floor, and that workers on the shop floor can partake in the risks involved with entrepreneurial decisions.

The data show that collaborative leadership dynamics on the vertical interfaces did emerge and greatly contributed to an improved functioning of the adaptive coping cycle. It could well be that this transformation from an intimidating to a collaborative interaction occurred as a maturing effect of the earlier action research projects. But this would be a difficult thing to prove. One could point to the fact that the manager who solved the crisis at the ZOR-F plant had participated in the last part of AR3. On the other hand, however, most individual players did not have a history in Delft and at Gb. So it seems safe to say this is not about individual learning, but about organizational learning. And maybe the transformation can only be understood from a higher level still. From a sociological perspective, both the planned and the emergent changes can be interpreted as expressions of a social trend toward the firm as a collaborative community. The American sociologists Adler and Heckscher (2006) have argued that this distinctively new form of collaborative community is being developed in the womb of the most advanced business organizations today, with contribution, concern, honesty, and collegiality as the new social values. The history of the anti-infectives business in Delft illustrates this development, with all the attendant contraction pains.

Articulation of Interaction Rules

This section showed a new leadership dynamic at the vertical interface. The interaction rules distilled from this intermezzo can be found in Table 2. They validate the CEO's rule ("When you have a good idea, go for it.") and three rules found in the literature ("connect to local interactions," "engage in humble inquiry," and "invite diverse people to reflect on the strategic direction").

It is the concept of collaborative community that is intellectually intriguing because it helps us to understand the transformation not (only) as the result

of planned change, but also as the outcome of an emergent social change. Maybe the potential space between the old and the new company has allowed this new type of community to emerge. Would it be possible to redesign such a collaborative community to an even higher level of self-management? This is the topic of the last action research project of this chapter.

AR4: THE STAR-ROLE PROJECT

An intriguing action research setting evolved when operators participating in a training program changed the problem definition of the production manager and then led the change process as a collaborative redesign process with an inquiring attitude. At stake in this action research project was the administrative agility of the plant.

ABX Dynamics

The primary client was the production manager who was accountable for both the ZOR-F plant and the enzymes plant, with all operators of the two plants reporting directly to him. Both plants had five self-managing teams working in 24/7 shifts. The shift teams had no team leader and each operator performed, in addition to his production task as a "star point," a resourcing task in his team, collaborating with the operators that had the same star-point role in the four other teams. The star point task areas were: HR, quality, safety, process, and projects. The felt difficulty of the production manager was how to improve collaborative decision-making at the interface between him and the five star-point roles of a task area. When there were differences of opinion between the operators, especially where personal interests are involved, tensions rose and the star-points did not cope with the conflict, making the situation unmanageable for the production manager.

The production manager decided to organize training for the operators that had the HR star-point role first, and offer similar training to the other star points if successful. As this gesture of "offering training" often produces a resistance response among the participants of a training program, the two external OD practitioners (EODP's) negotiated role clarification as a second objective of the project. They agreed on the inquiry question: What is the role of an operator as a "star point" and what competences are

needed to be successful in this role? The EODPs approached the contracting meeting with the manager, the interviews with the 2×5 HR-responsible operators, and the first morning of the training in a mode of humble inquiry, intent on getting a clearer picture of what actually is the felt difficulty that the different actors brought to the table. The enzymes plant was the first to start and a fascinating leadership dynamic developed. A year later, the ZOR-F plant followed but this group of HR-responsible operators was unwilling to take any initiative. This section focuses on the enzymes plant.

Design of Learning Mechanisms

The EODPs viewed a training program as a structural learning mechanism for creating sufficient space and time for a dialog. After the interviews with all HR-responsible operators to prepare the program, the EODPs selected Adams' (1976) model of the boundary role person as the cognitive learning mechanism for role clarification. The training program was structured with role clarification in the morning, communication exercises in the first part of the afternoon, and a discussion about the HR star role with the production manager in the second half of the afternoon. The sequence of activities in the morning was feeding back the results of the interviews, building a shared purpose for the training, sharing and comparing experiences as HR star roles, and facilitating an inquiry into what the problem with the star role actually is.

An Extraordinary Conversation

In the morning of the training, three of the six HR star-point operators showed up. They were in a good mood, but first wanted to know the objective of the training. The trainers discussed the dual purpose of role clarification and competence development and the day's structure. The three participants agreed that the star-role model did not work so well and expressed a desire to clarify roles and relations. They responded when the trainers invited them to give each other feedback with the help of the model of six dysfunctional behaviors of a boundary role person. A probing search then uncovered the actual problem. As HR star points, they met two or three times a year, during which meetings they often found themselves concluding that none of the agreed objectives of the previous meeting has been

achieved. A lot of star-point work was simply not carried out and this hindered everyone in their day-to-day work. Furthermore, the composition of the teams had just been changed and one team now had two operators with the HR star-point role.

Joe[9]*:*	*"We have two HR star-point roles in our shift team. Which one of us should stop with the HR role and chose another star-point role to do? We both enjoy HR. And when I look at the tasks of the other star-points, I see tasks I like and tasks I don't like. So switching for me is not attractive. We are stuck."*
John:	*"We think too small when we only look at the role allocation in the shift teams. I keep saying: A shift team is just a schedule arrangement; the only team is the operators of all shifts together."*
Harry:	*"Yes. OK, but that does not solve Joe's problem of having two persons in his team who both do HR and want to keep doing HR."*
Joe:	*"Why can't we decompose the task of a star point? Then I could do tasks of another star point, but only those that I find interesting."*
John:	*"We can only solve this problem at the level of the whole team, not at the level of the shift teams."*
Trainer:	*"We agreed this morning that the trainers could intervene in the way you communicate. Joe, do you feel that John is building on your idea?"*
Joe:	*"No."*
Trainer:	*"John, why don't you build on the Joe's idea?"*
John:	*"Because I don't understand it. If Joe is allowed to do only the tasks he likes, how could that be a solution for everyone?"*
Joe:	*"My idea is that everyone is allowed to select the tasks he is interested in. If everyone does things he is interested in, everyone will probably do a good job."*
John and Harry:	*"I don't get it."*
Trainer:	*"Joe, would you be willing to draw a diagram of your idea on the flipchart?" (Schuiling & Thierry, 2013)*

When Joe had drawn the diagram, everyone understood it immediately: This really was an alternative to the present star-point model. The present star roles had a list of tasks, each with its own label: HR, quality, and so on. Joe proposed deleting the five labels and making one big list of maybe 20 or 30 tasks and then letting all the operators chose which tasks they wanted to do. He proposed two criteria: (1) What am I good at? and (2) In what area do I want to develop? Suddenly John realized this idea actually implemented his own idea of seeing all operators of the five shifts as one team, because the big list of tasks applies to the whole team and each task is allocated to members of the whole team. John said the benefit of this new model was that everyone is individually accountable for the results of his task; no one can think anymore that someone else will do the job.

When the trainers asked whether they wanted to present this idea to the production manager later that afternoon, the answer was an unhesitating "yes." They helped the operators to transform the idea into a proposal for decision-making that the operators could present to their manager. After their presentation, the production manager responded spontaneously: "I get tears in my eyes hearing you present a proposal that is so well thought-out. And also tears because you have abolished the concept of self-management. But we need a discussion on this plan, even if it might lead to something other than what you propose." So he invited them to present their proposal to the other three HR-responsible operators who were not present at this training.

The three then took the lead in a process of inquiry, first presenting their proposal to the other three HR star points and later on to all other colleagues to enable a decision that is made by the whole team. Two operators did not agree with the proposal, one of them saying it was the communication, not the structure, that was the problem. This dissenting operator was included in the leadership group. This group then led the detailing and implementation of the plan. The two trainers then became facilitators of the operator-led inquiry process and started bringing in design expertise to further transform the proposal to a detailed organizational design. This facilitator role of the EODPs was negotiated with the operators and the production manager directly after the first training. The EODPs proposed that the operators include peer accountability in the new design, a proposal to which the operators responded with hesitation. It was the dissenting operator who came up with the creative idea of giving this idea a try by inviting the four operators who already had an individual "whole-team-role" to describe their role in the new format and by having a meeting to pilot a peer accountability conversation between the four of them. One of

the EODPs facilitated this meeting. This collegial accountability conversation removed all doubts and hesitations, both about the new design of "whole-team-roles" and about the principle of collegial accountability. Five months later, the production manager organized a shutdown of the production for two days to create the space and time for all operators as a whole team to define the list of roles and allocate these roles among them (Fig. 7), as well as to discuss technical affairs.

Leadership Dynamics

The business performance of the enzymes plant was fine and the market was willing. Collaboration in this case was not engendered by a collective threat. The leadership role shifted from the production manager to the HR-responsible operators. The three HR-responsible operators first followed the lead of the production manager by accepting the invitation for a training program, after which they initiated their leading role by presenting a proposal for redesign to the production manager. The production manager then followed their proposal and invited them to take the lead in the

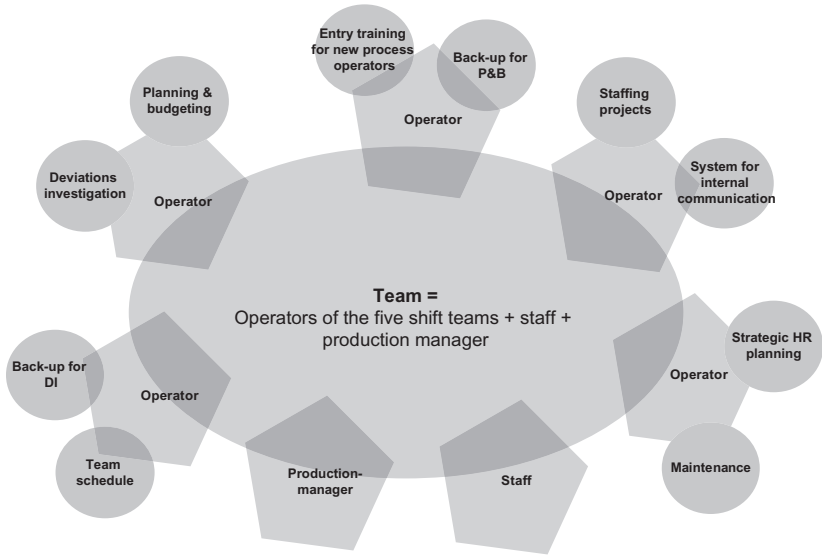

Fig. 7. The Design of the Extended Self-Managing Team.

redesign discussions with their colleagues. The two action researchers had an enabling role in this creative dynamic of shifting leadership roles. In a very specific way, they also took a leadership role when they invited the three operators to present their idea to the production manager, knowing this step was outside their mandate but within the scope of the production manager. Their task was to deliver a training program, but their purpose was to improve the decision-making process between operators and production manager, and this was exactly what happened when the operators redefined the felt difficulty and propose a redesign. The first response of the production manager ("tears in my eyes") to the process was spot on ("discuss your proposal with your colleagues"), while he incorrectly assessed the content of the proposal ("this is the end of self-management"). After some months, he realized to his great satisfaction that both the process and content of the redesign was leading to a higher-level self-managing team.

What possibly triggered and enabled this change in leadership dynamics was the desire of the operators to be more appreciated for all their responsibilities. During the lunch at the first training-day, the three operators told the EODPs that all operators collaborated in an informal joint initiative to influence management to raise their job level in the HR classification system. They would see this rise as an acknowledgment of the value of their work. While it is possible they perceived the new star-role system as a way of making this extra value more visible, this was never discussed.

Articulation of Interaction Rules

Fig. 7 visualizes the design of the new organization of the self-managing teams. Together, the five shift teams are viewed as a single team and even include the manager and the staff. Each operator works all-round (the pentagon) and is in the lead and accountable for one task area (the circle). In this task area, he supports the work every operator is required to do and coordinates where necessary. For each task area, there is an operator who acts as backup (most of the time this is a person who wants to learn to master this task area). The nature of the task is to ensure that information is up to date, provide human and material resources, develop policy and run projects.

This action research project generates four new rules and elaborates one old rule (see Table 2). The next section summarizes all the rules found in this study.

Table 2. Overview of Collected Interaction Rules and Their Impact on Leadership Dynamics at Agility-Critical Interfaces.

	Interaction Rules Used in the Local Change Effort	Impact on Agility
Interaction rule of the CEO (1989–1998)	1. When you have a good idea, present it to your boss. If he rejects it, and you still believe your idea is good, don't take no for an answer and go to the boss of your boss, if possible together with your boss. Go all the way until either you find out your idea is not that good or you get support for it.	
The intimidation case (1995–1997)	2. When reality is threatening, forbid people from bringing forward valid information that questions the assumptions of the current strategy.	Failed competitive agility of the division for many years. Loss of market leadership.
Literature (2001–2013)	3. When the administrative-hierarchical approach is counterproductive, pose good questions that help to enlarge possible worlds and possible ways of being in relationship. 4. When you see as a manager that change is needed, connect to local interactions. 5. When the generation of shared purpose is an ongoing task, invite diverse people throughout the organization to reflect on the strategic direction, and, by highlighting issues from their perspective, to contribute to its reformulation. 6. When you are interdependent on the knowledge of lower-level workers, engage in humble inquiry. 7. When reality is threatening, provide a holding environment that allows for containment of tensions and anxieties.	Good relationships and open communication between all parties that have to do the right thing (i.e., are interdependent).
The Redesign project (1995)	8. When you become manager in an organization that has a hierarchic culture that hinders agility, connect to local interactions by confronting hierarchical routines and showing collaborative behavior in issues that are critical to restore agility. 9. When you are an action researcher and management is proceeding with determination on a route that you know will not be effective, stay in the mode of humble inquiry and explore the felt difficulty of all stakeholders until the wrong route itself becomes the felt difficulty.	Improved operating agility at the interface between plant and owner shows in the fact that the new American manager: • accepts the invitation to join the change team in August 1995 and quickly approves the design of the new organization, adding some further improvements;

10. Even when objectives and interests conflict, invite diverse people throughout the organization to reflect on the strategic direction.
11. When reality is threatening, provide and ask for valid information to enable everyone to understand fully the situation and be honest about conflicting interests and allow everyone a personal choice whether or not to collaborate in the change.
12. When you are an operator and there is a shared purpose and management acknowledges its interdependence on the knowledge of the operators, contribute your best knowledge to the redesign of the productive process.
13. When a holding environment is needed, written tasks, playful interaction and time outs enable individuals and groups to work through the anticipated consequences of the envisaged changes for themselves, their work, and their social life.

- withdraws within a year and promotes local people as management, for the first time in the history of the plant.

Improved operating agility at interfaces between the functions shows in new technology, organizational design and production planning policy being implemented with unprecedented speed.

Improved operating agility at the interface between management and employees shows during an additional restructuring in the Spring of 1999 when management and employees have a 2-day workshop with 60 people to work through the loss of extra 58 jobs, leaving a plant of 85 people.

The plant survived and is now a part of Dupont Industrial Biosciences.

The Building on Strength project (1998)

14. When people make statements that challenge your way of being in a hierarchical relationship, simply deny that their statement is true. (The CEO in the first module)
15. When it is threatening to confront the CEO, a good night's sleep, sharing your feelings at breakfast and a trainer team that is supportive for your endeavor provide for a good-enough holding environment. (This replicates rule 7)
16. Proposing to speak for yourself and about your own experiences is a good way for an action researcher to mediate in a confrontation between administrative and adaptive leadership.
17. When you are criticized, connect with the people who have criticisms, even when you are the CEO and the critics work several management levels below you. (This elaborates on rule 4)
18. When blame attribution is a normal interaction pattern, "what went wrong?" is a good question to start a humble inquiry, as it invites an inquiry of leadership dynamics. (This details rule 3)

14: As-if communication at vertical interface, with no contact to reality.

15–17: Improved individual competence of participants to self-regulate behavior as a full partner in interactions at critical interfaces in their work situation.

Table 2. (*Continued*)

	Interaction Rules Used in the Local Change Effort	Impact on Agility
The Work Stress project (1998)	19. When you are an action researcher in a situation where leadership dynamics are frozen, inquire with an exploring attitude the felt difficulty of the different stakeholders and pose good questions that enlarge possible ways of being in relationship. (This replicates rule 3) 20. When you are a scientist or analyst and there is a shared purpose and management acknowledges its interdependence on the knowledge of the workers, contribute your best knowledge to the redesign of the productive process. (This replicates rule 5 and 12) 21. When reality is threatening, provide a holding environment that enables individuals and groups to work through the causes and effects of organizational stress for themselves, their discipline, their job group, their project team and for the department as a whole. Use written tasks, a playful style, and time outs. (This replicates rule 7 and 13) 22. Saying "no" to a request for extra work is legitimate when you explain what makes the task so difficult to do it in the time available. (New rule)	Successful implementation of the ZOR-F technology in the new plant and many years of constant yield improvement. Creative adaption to a new additional strategy in which R&D itself was the business by developing and selling its knowledge to other businesses.
The intermezzo (1993–2006)	23. When you have an idea for adaptive change as a scientist, connect directly to the responsible business manager to discuss whether the idea is relevant for the business. (This replicates rule 1) 24. When you are a middle manager with the task to solve a crisis in an organizational innovation, but you don't know how, ask the knowledge workers what they expect of you as their manager. Trust them to solve the problems in their productive process. Manage the interface with the outside world. Facilitate solving practical problems. (This replicates rule 6)	Improved innovation agility thanks to adaptive leadership of scientist and business manager. Improved entrepreneurial agility as the confidence of the new owner in the merger depended on the success of (their investment in) the ZOR-F plant, and the confidence of the operators depended on the credibility of the firm's China strategy.

	25. When you are a middle manager and top management undertakes a strategic study that could be experienced as threatening by your operators (i.e., knowledge workers), involve them in the issues of this study and invite them to design scenarios for the issue they can oversee. (This replicates rule 5)	
The Star-role project (2012)	26. When you are an action researcher in a situation where workers are expected to take leading roles, attend to the process of communication between the workers, to enable the group delivery of a good idea they might take leadership for in relation to their manager and colleagues. (This elaborates on rule 3) 27. When the decision-making process is complex because of many horizontal and vertical interfaces, support and legitimize the lead of those workers who have an idea how to simplify the structure of interfaces. (New rule) 28. When someone dissents from the majority for a good reason, include him/her in the leadership group. (New rule) 29. When one struggles individually or as a small group with a difficulty, involve responsible others to contribute to solving the difficulty. (New rule) 30. When workers agree on the principle that they are responsible to manage their own work, propose a procedure for collegial accountability. (New rule)	Improved agility at the interface between operators and management shows when operators allocate themselves to the list of roles without any tensions and within an hour with production manager and staff observing but not interfering in this decision-making. Improved agility between the operators shows when each individual operator has a conversation with two colleagues to render account on the performance in his role and develop agenda for next six months. Improved agility at the interface between primary process and resourcing processes.

RESULTS: THREE SETS OF INTERACTION RULES

This study has resulted in a list of interaction rules and data about their impact on the effectiveness of leadership at agility-critical interfaces (Table 2).

The list of rules in Table 2 has been copied from the CEO, the literature, and the six case studies. Some rules validate each other in a different setting, thus enabling a generalized formulation of the rule. But more important for now is that the rules address interaction partners in the leadership process and thus can also be grouped according to the actor the rule addresses. Table 3 clusters all rules from Table 2 in three actor groups: manager, knowledge worker, and action researcher. The attractive benefit of this list is that the coherence of the interaction rules can be checked. If one actor applies "his" rule, will this trigger a creative response in the other partners in the interaction? And if it does not, how can other partners apply one of their rules to promote a creative responsive process? In this way, the interaction rules themselves can be used interactively. Consequently, we avoid the mono-disciplinary myopia that only formulates rules for one actor and sees "the other" as an object for the unilateral application of the rule.

All rules can be tested in new action research projects. The purpose is not to develop a new theory of action research, or a new theory of leadership, or a new theory of the knowledge worker. The purpose is to develop practical knowledge of how to act and learn at the interface between these interaction partners.

DISCUSSION

In this study of changing leadership dynamics at critical interfaces, a strong connection has evolved with the sociological theory that a distinctively new form of collaborative community is developing in the womb of the most advanced business organizations today, with contribution, concern, honesty, and collegiality as the new social values (Adler & Heckscher, 2006). We have seen that the collaborative community works as a powerful engine for action research. The manager of the intimidation case did not want an action researcher around him; in fact, he tried to kick him out of the company. The managers with the collaborative approach initiated action

Table 3. Interaction Rules Clustered Per Interaction Partner.

Interaction Rules for Managers	Interaction Rules for Knowledge Workers	Interaction Rules for Action Researchers
With negative impact on agility 1. When reality is threatening, forbid people to bring forward valid information that questions the assumptions of the current strategy. 2. When people make statements that challenge your way of being in a hierarchical relationship, simply deny their statement to be true. *With positive impact on agility* 1. When you see as a manager that change is needed, connect to local interactions. a. When you are criticized, connect to the people who have critique, even when you are the CEO and the critics are at several management levels below you. 2. When the generation of shared purpose is an ongoing task, invite diverse people throughout the organization to reflect on the strategic direction, and, by highlighting issues from their perspective, to contribute to its reformulation. a. Even when objectives and interests conflict, invite diverse people throughout the organization to reflect on the strategic direction.	*With positive impact on agility* 1. When you have a good idea, present it to your boss. If he rejects it, and you still believe your idea is good, don't take no for an answer and go to the boss of your boss, if possible together with your boss. Go all the way until either you find out your idea is not that good or till you get support for it. 2. When you are a worker and there is a shared purpose and management acknowledges its interdependence on the knowledge of the operators, contribute your best knowledge to the redesign of the productive process. 3. When it is threatening to confront the CEO, a good night's sleep, sharing your feelings at breakfast and a trainer team that is supportive for your endeavor provide for a good-enough holding environment. 4. Saying no to a request for extra work at the interface is legitimate when one openly and honestly explains what makes the task that difficult that one won't be able to do it in the time available.	*With positive impact on agility* 1. When the administrative-hierarchical approach is counterproductive, pose good questions that help to enlarge possible worlds and possible ways of being in relationship. 2. When reality is threatening, provide a holding environment that allows for containment of tensions and anxieties. a. When a holding environment is needed, written tasks, playful interaction and time outs enable individuals and groups to work through the anticipated consequences of the envisaged changes for themselves, their work, and their social life. b. This rule also applies to the working through of the causes and effects of organizational stress in an R&D department. 3. When you are an action researcher and management is proceeding with determination on a route that you know will not be effective, stay in the mode of humble inquiry and explore the felt difficulty of all stakeholders until the

Table 3. (*Continued*)

Interaction Rules for Managers	Interaction Rules for Knowledge Workers	Interaction Rules for Action Researchers
b. This rule also applies when you are not in the lead of the strategic dialogue When you are a middle manager and top management undertakes a strategic study that could be experienced as threatening by your operators (i.e., knowledge workers), involve them in the issues of this study and invite them to design scenarios for the issue they can oversee. 3. When you are interdependent on the knowledge of lower-level workers, engage in humble inquiry. This rule also applies in a situation of crisis. When you are a middle manager with the task to solve a crisis in an organizational innovation, but you don't know how, ask the knowledge workers what they expect of you as their manager. Trust them to solve the problems in their productive process. Manage the interface with the outside world. Facilitate solving practical problems. a. When there is a shared purpose and management acknowledges its interdependence on the knowledge of	5. When one struggles individually or as a small group with a difficulty, involve responsible others to contribute to solving the difficulty. 6. When someone dissents from the majority for a good reason, include him/her in the leadership group.	wrong route itself becomes the felt difficulty. 4. Proposing to speak for oneself and about one's own experiences is a good way for an action researcher to mediate in a confrontation between administrative and adaptive leadership. 5. When you are an action researcher in a situation where leadership dynamics are frozen, inquire with an exploring attitude the felt difficulty of the different stakeholders. 6. When you are an action researcher in a situation where workers are expected to take leading roles, attend to the process of communication between the workers, to enable the group delivery of a good idea they might take leadership for in relation to their manager and colleagues. 7. When workers agree on the principle that they are responsible to manage their own work, propose a procedure for collegial accountability.

the knowledge workers, the workers will contribute their best knowledge to the redesign of their productive process.

4. When reality is threatening,
   a. Provide a holding environment that allows for containment of tensions and anxieties.
   b. Provide and ask for valid information to enable everyone to understand fully the situation and be honest about conflicting interests and allow everyone a personal choice whether to collaborate in the change.
5. When you become a manager in another culture, connect to local interactions by confronting hierarchical routines and showing collaborative behavior.
6. When in the administrative-hierarchical approach blame attribution is a normal interaction pattern, "what went wrong?" is a good question to start a humble inquiry, as it invites an inquiry of leadership dynamics.
7. When the decision-making process is complex because of many horizontal and vertical interfaces, support and legitimize the lead of those workers who have an idea how to simplify the structure of interfaces.

research projects that changed the leadership dynamics. The collaborative redesign process in AR1, the Building on Strength program with its dialogs between high potentials and senior managers, and the sequence of large and small group meetings of the whole R&D department in AR3 were one-event expressions of this type of community, all with a greater or lesser impact on business agility. The extended-team meeting of the enzymes plant in AR4 is a regular twice-yearly meeting of the community of all people working at the plant. The idea of the operators to organize the resourcing tasks of the operators as individual roles on the level of the whole team and not as boundary roles on the level of the five shift teams is a decisive step toward a design theory of relationships in a collaborative community. Three design principles can be distilled from this case (building on and modifying the accountability formulations of Jaques, 1996):

1. Collegial accountability relationships (CAR) are relationships in which a team of colleagues is authorized to allocate tasks to members of the team based on valid information about their competences and developmental ambitions, and in which colleagues individually hold each member accountable for his output.
2. The tasks of the extended team (as a "collaborative community") are:
   a. To define the roles in the extended team;
   b. To create a holding environment in which team members personally render an account to (for instance, two) colleagues about their actions and are given recognition for those actions;
   c. To provide the time and space for dialogs on technical, social, strategic, and policy issues between all members of the community.
3. A hierarchical accountability relationship (HAR) is a relationship in which the manager is authorized to get an employee to do something, and is also accountable by his own manager for the output of his employees.

a. The manager has the authority to take unilateral decisions and can chose to use this authority; that is: he is authorized to approach issues at the vertical interface either in a unilateral or in a collaborative way.
b. The idea of the collaborative community changes the formal definition of the hierarchical accountability relation in one important way. Accountability runs two ways: up and down. Thus a manager is also accountable to his knowledge workers about his actions and is given recognition for those actions by them.

Principle 1 is a reformulation of the lateral accountability relationship of Vorstman and Galbraith. It is AR4 that finally allows us to give a

good name to this type of accountability relationship: the collegial accountability relationship. Principle 2 balances autonomy with solidarity. Principle 3b is a decisive modification, compared to the theory of both Vorstman and Jaques, as it changes in a minor but important aspect the nature of the hierarchical relationship. The cases support this modification. Gb's CEO applied principle 3b in the fall of 1992 when he explained to the result team members who he had mobilized in the previous last two years why he had decided to stop mobilizing them. Such a downward account was crucial for maintaining collaborative relationships with them for all the changes, learning, and innovation that were still to come. Gb's CEO reapplied principle 3b when he came back in AR2 in 1998 to discuss with the participants what had gone wrong in the dialog between them. "Going back," "reconnect," and "process-oriented inquiry," are the terms that describe the elemental gesture of a higher-level manager who enables a recognition-providing response from lower-level employees.

These formulations of organizational relationships are intended to help firms move forward to more collaborative forms of community, with a productive tension between individual and team accountabilities. New action research projects will be able to test the three design principles formulated above. The most critical test would be to help senior management to apply these principles in the strategic process.

Furthermore, when the trend toward a collaborative community functions as an engine for action research, action research itself can function as an engine for articulating the rules of the collaborative community. The common denominator of the interaction rules found in this study seems to be that managers and workers negotiate in a creative, responsive way the felt difficulty and one's role in working on it. This negotiation starts with a humble inquiry and can lead to extraordinary conversations that allow people to step out of their ordinary patterns of thinking, communicating, and relating. Two critical ingredients are respect for the (potential) value of the contribution of the other and putting good questions in such a way that people cannot walk around them, holding the tension that the question contains for them. Intervening "outside the ordinary" to find the "optimal learning points" (Weick & Westley, 1996) requires both trust and courage. One can be a courageous action researcher, but when there is no trust in the relationship with the primary client, the action research project will come to a premature end.

Much more research is needed to find and articulate the interaction rules that enable action research to create a dynamic balance between

administrative and adaptive leadership. But, as we hope to have demonstrated in the four projects, there is great potential here for action research.

A last question is whether these interaction rules work better in Dutch culture than in other cultures. The Dutch are known for their collaboration between the social classes, a leadership dynamic that emerged in the fight against the water over many centuries (Shorto, 2013). However, the Belgium case AR1 contributed essential insights about leadership dynamics in collaborative redesign. And in AR2, it was a Portuguese who confronted the CEO with his offensive behavior. The drivers toward collaborative interaction at vertical interfaces are the same all over the world: The importance of knowledge in the creation of added value and the importance of customer focus throughout the whole organization. So while this longitudinal study may certainly be classified as typically Dutch, the sets of interaction rules aim to contribute to what Adler and Heckscher (2006) call an "ethics of interdependent contributions," combining autonomy and solidarity in new ways. The need for such an ethics may be considered a global one, and can only be fulfilled by different cultures putting in interdependent contributions.

CONCLUSION

This longitudinal study shows that over the 25-year timespan – in the context of the anti-infectives and enzyme businesses in the Netherlands and Belgium – progress can be observed from hierarchical interactions to collaborative interactions between leadership roles at vertical interfaces, with managers and workers sharing change leadership. Managers involve knowledge workers in strategy development even in times of crisis when the future of the business, and thus employment, is at stake. And workers show adaptive leadership in their primary and innovation processes, initiating changes that improve the agility of their process. To understand and promote this development, a conceptualization is proposed that defines the organization as a bundle of productive processes, in which general managers are the "knowledge workers" of the strategy processes and knowledge workers self-manage the primary process and innovation process. We saw this change planned in four action research projects and emerge in the time in between.

This study also shows that a collaborative community can emerge out of an organization in which the tensions between administrative leadership

and adaptive leadership have resulted in an intimidating culture. This is a hopeful conclusion for OD practitioners: We can have our ideals and eat them too.

Finally, this study shows that the main learning mechanism that helps managers and knowledge workers change their interaction pattern are interaction rules that allow them to negotiate the felt difficulty and one's role in it in a creative, responsive way. Over the 25 years, we can observe a progression from managers mobilizing knowledge workers as change agents ("Com' on!") via managers inviting knowledge workers to collaborate in organizational redesign to knowledge workers proposing the redesign to their manager. If the thesis of the collaborative community proves to be a valid one, every firm and even every business within a firm will have its own zigzag path toward it. This study showed one such zigzag path.

NOTES

1. The term "knowledge worker" is used in a broad sense in this chapter; operators in a high-technology environment are also knowledge workers.
2. In the English version of his book, Vorstman (1993) distinguishes "hierarchical relation" and "accountability relation." This wording is unfortunate as the hierarchical relation is also an accountability relation (Jaques, 1996). Galbraith (1973) distinguishes hierarchical and lateral relations. Vorstman does not refer to Galbraith's term lateral relation which in its "simplest form" is "direct contact between two people who share a problem" (Galbraith, 1973, p. 18). To strengthen a culture of commitment, Vorstman stresses that such a contact leads to an agreement for which both are accountable. The rewording in this study honors the accountability in both relations and distinguishes between hierarchical and lateral. Galbraith's term "lateral relation" is too neutral to invite people to render an account to colleagues.
3. The term "IODP" is used for the role of the action researcher as an internal OD practitioner; the term "EODP" for the role of external OD practitioner.
4. Ansoff (1984) speaks of five types of "organizational responsiveness"; I will use the term "business agility."
5. Hoebeke speaks of work system; I will use the term "business."
6. This builds on the discussion with Theo Hermsen, Marjolijn Bramer, and Hans Vermaak in the preparation for the annual meeting of the Dutch Association of Management Consultants on the theme of "extraordinary good conversations" in 2013, initiated and led by a group of young consultants.
7. See for the concept of the "economy of balance": Negt and Kluge (1981).
8. Vansina helped the IODP in creating this design.
9. These are not their real names.

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APPENDIX

Year	Event	OD Intervention
1989	New CEO of Gist-brocades (Gb)	Strategic change: back to the core Method: disinvestment of the non business-to-business activities Cultural change: defining new values and experimenting with cross-functional result teams Method: team coaching and large group meetings by consultancy firm EMP
1988–1992	Author works in management consultancy firm Twynstra Gudde (TG)	TG trains lead engineers of Gb in project management Method: training with a combination of hard skills and soft skills
1992	Author starts in new job in Gb as internal OD consultant	Purpose of internal OD practitioner (IODP) is to transfer the learning of the result teams to rest of the organization Method: interview all teams and develop a life cycle model of a cross-functional team
1992 October	Crisis between Gb management and external consultancy firm	Arrange a meeting between CEO and internal change agents to discuss risk of alienation Method: dialogue Search for a new external consultant that is wise and aspires minimal involvement
1993 January	Contract Harald Vorstman as consultant (a former manager of Philips and professor at the University Twente)	Embed entrepreneurship in the organizational structure Method: Vorstman and IODP help divisions to redesign management structure and define the role of entrepreneur (business manager) Decentralize corporate R&D to divisions Method: first dialogue in GbMT on rationale and model, with help of Vorstman and IODP; then implementation by project management with help of Steve Frobisher, external consultant

Appendix. (*Continued*)

Year	Event	OD Intervention
1993	Start of innovation of enzymatic fermentation process	IODP has small role: helps to make the scenario-method used by the innovation team transferable to others
1995	Cost reduction enzymes plant Bruges	IODP helps to align the two goals of cost reduction and empowerment by introducing external consultant Vansina. Method: collaborative redesign based on action research philosophy
1996	Plant manager Bruges feels the need to develop indicators to monitor progress on values as empowerment, open communication, integrity	IODP gets the assignment to develop indicators for personal and organizational development Methodology: action research as part of PhD project
1996	Crisis in HR	Method: survey feedback IODP and external consultant collaborate with HR to develop a differentiation between local and global HR and form Gb Netherlands as a new unit
1997	Ongoing dissatisfaction in R&D with decentralization of R&D	Corporate HR director initiates evaluation of decentralization. Method: Steve Frobisher and IODP do interviews in R&D and divisions and feed data back to team of corporate and divisional managing directors
1998	Ongoing complaints in R&D of Penicillin division about work stress	IODP is assigned by R&D director to research level and causes of stress Methodology: action research Methods: survey feedback, large group conference and team building of MT
1998	Ongoing stress of newly appointed entrepreneurs	IODP designs "Building on Strength" as new in-company training program Methodology: action research Methods: organizational survey, 360-degree feedback, self-diagnosis with help of Core Quadrants (Ofman) and dialogue with senior managers

Appendix. (*Continued*)

Year	Event	OD Intervention
1998	Merger with DSM	Integration of divisions and termination of Gb headquarters Method 1: project teams to integrate each division and function Method 2: large group meetings for cultural integration. Core Quadrants proof to be also an effective tool for dialogue about perceptions of each other's culture
1999	Management feels the need for organizational learning about acquisitions and integration	Evaluation management approach of the merger Method: have interviews and feed back the data in workshop together with all key stakeholders. Manager internal consultancy unit + IODP
2001, December	IODP defends his PhD	Several bilateral meetings to discuss draft or final dissertation with former CEO of Gb, a business group director, and participants of AR1, AR2, and AR3.
2002, January	New corporate HR Director announces termination of internal consultancy unit	
2002	IODP hears the story of the intimidation of the pen business team in 1995 while having lunch in canteen of the firm in Delft	IODP initiates research project to find out what happened Methodology: qualitative research Method: interviews with key players result in publication, not in any intervention, as this is research in the past tense
2003	IODP becomes EODP	IODP starts independent consultancy practice OD and Research
2006	HR decides to design a new learning architecture	EODP designs the model of roles in processes as conceptual basis for talent development and professionalization
2006	EODP has first contact with the two self-directing plants in Delft	EODP has interviews with many persons involved in the self-directing plants, has several publications and invites plant people as guest speaker to several conferences Methodology: qualitative research

Appendix. (*Continued*)

Year	Event	OD Intervention
2008	The corporate technology officer of feels the need to make uniform descriptions of all scientist positions in the worldwide R&D function	The EODP designs every scientist position as a portfolio of roles in multiple processes by linking the full-process model to DSM's model of three lines of authority
2010	Start of *Thierry & Schuiling* (T&S)	A merger between OD&R and Ella Thierry Career Coaching: two EODP's
2011	Production manager Delft feels the need to develop key people in the two self-directing plants	The two EODP's train the three operation experts of the self-directing plants in Delft in working with the paradox of "Directing self-direction"
2012–2013	New production manager is confronted with a conflict between the operators in the ZOR-F about a decision of his predecessor	The two EODP's receive the assignment to develop the skills of the star-points HR in handling conflict and showing leadership Methodology: action research Method: interviews with all star-point HR, select a theory, design and deliver a training, support star-points Enzymes plant in redesigning the socio-technical star-point model to a "roles in a higher-level team" model